VOL. IV. NO. 156.

GARDEN AND FOREST

A JOURNAL OF HORTICULTURE LANDSCAPE ART AND FORESTRY

FEBRUARY 18 1891

PRICE TEN CENTS.] Copyright, 1891, by THE GARDEN AND FOREST PUBLISHING COMPANY. [$4.00 A YEAR, IN ADVANCE.

Flower Pots.

We give special attention to private trade, and keep always on hand a large and selected stock of perfectly made Pots, as follows:

Hand-made, old pattern, from 4-inch to 24-inch inclusive.
Machine-made, from 2-inch to 4½-inch, old pattern, straight sides.
"Standards," from 1¾-inch to 12-inch inclusive.

Distance should not prevent private trade from using the best Pots that are manufactured, as freights are very low and breakage nominal. Correspondence solicited.

A. H. HEWS & CO.,
North Cambridge, Mass.

SHRUBBY SPIRÆAS,
Ariæfolia, Thunbergi, Van Houttei, etc.

ROSES
CLEMATIS,
HYDRANGEAS, BERBERIS, ETC.,
Hardy Herbaceous Plants,
Spiræa Japonica grandiflora, New.
Send for Catalogue.
REA BROTHERS, Norwood, Mass.

STANDARD FLOWER POTS.
We defy all competition in quality of goods, prices and shipping advantages. Send for list.
SIPPLE, DOPFFEL & CO., Syracuse, N. Y.

Yale Strawberry.
A late variety, of large size, perfect blossom. Splendid shipper and of excellent quality. Send for circular. Address STEPHEN HOYT'S SONS, New Canaan, Conn.

Parsons & Sons Co.
LIMITED.
Kissena Nurseries, Flushing, N. Y., offer
Rhododendrons
of American grown hardy sorts.
Prunus Pissardi,
on its own roots, exquisite crimson foliage.
Hardy Azaleas,
well known for their beauty.
Malus Halleana,
(syn. Parkmani.)
brought to us by Dr. Hall in 1862; first sent out by us in 1865. Its petite buds are brightest crimson of exceptional beauty, and well known.
For other rare and old plants, see Catalogue.

FITZWATER PEAR
COLORED PLATES and CIRCULARS FREE. Send Postal card.
FITZWATER PEAR CO., Lim'td, Himrods, N.Y.
Send 10 cents for Illuminated Calendar and 3 Colored Plates.

ERIE RAILWAY.
The Picturesque Route of America. Via Niagara Falls or Chautauqua Lake. An Enchanting Panorama of Mountains, Forests and Streams.
SOLID TRAINS between New York and Chicago. No change of cars. VESTIBULED LIMITED (strictly first-class), without extra charge for fast time and superior service.
W. C. RINEARSON, General Passenger Agent.

THE THERMOSTATIC INCUBATOR.
The most reliable machine made. Fully guaranteed. Used by leading Poultry raisers. *If you wish to know all about this really first-class Incubator send for circular, free.* Send for Warner's catalogue of Brooders and Hot Water Heaters. JAS. E. WARNER, 19 Park Place, New York City.

GLASS
For GREENHOUSES, GRAPERIES, CONSERVATORIES, HOTHOUSES AND HOTBEDS.
VANHORNE, GRIFFEN & CO.
Importers of French Glass. Also American Window Glass.
Special Importation for Rose-house purposes.
131, 133, 135 & 137 FRANKLIN ST., NEW YORK CITY.

HARDY PLANTS.
Rhododendrons, Japanese Maples, Hardy Azaleas, Rare Trees and Shrubs. The finest and most complete stock in America. The finest Catalogue in the world is sent for 25 cts., which is allowed on first order.
B. A. ELLIOTT COMPANY, Pittsburgh, Pa.

SUGAR MAPLE TREES.
Large and small. 100,000 Seedlings for $40. Large Street Trees very cheap. 100 varieties of Evergreens and Ornamental Trees of all sizes at low rates. Catalogue Free. GEO. PINNEY, Evergreen, Wis.

WM. C. STRONG
HAS
TREES AND SHRUBS
of choicest kinds, including all desirable Novelties, and of such quality that they do not need advertising. Address at the new P. O., WABAN, Mass.

OLD FASHIONED GARDENS.
Designed and planted with *hardy* material.
JAMES H. BOWDITCH,
62 DEVONSHIRE STREET,
BOSTON, MASS.

N.Y. Engraving and Printing Co.
PHOTO-PROCESSES.
ENGRAVED PLATES FOR ALL ILLUSTRATIVE PURPOSES.
320-322 Pearl Street,
NEW YORK.

WAUKEGAN NURSERIES

NEW AND RARE

HARDY + EVERGREENS.

Three of the most beautiful Evergreens in cultivation. The only large stock in the market. Colorado Blue Spruce, Picea pungens, three inches to four feet high; Douglas Spruce of Colorado, three inches to six feet high; Abies concolor, a limited stock of fine specimens, six to nine inches high. Also a large stock of two-year Seedlings, four to six inches high. The above are all perfectly hardy in New England and on the Western Prairies.

Also, the largest stock of Evergreens in America, three inches to six feet high; together with a full and fine stock of

FOREST TREE SEEDLINGS,

including Maple, Ash, Elm, Birch, European Alder, Wild Black Cherry, Catalpa speciosa, European Larch, Black Walnut, etc., etc.

Waukegan is on the C. & N. W. R'y, north of Chicago. We ship at Chicago rates.

ROBERT DOUGLAS & SONS,

Waukegan, Ill.

IF YOU WOULD HAVE

CHOICE VEGETABLES

And **Beautiful Flowers,**
You must plant **Good Seeds.**
Do not go to the village store
But write **to-day** for

Burpee's Farm Annual FOR 1891

Which plainly tells
How to get the **Best Seeds,**
Without any Extra Cost,
Direct from the Growers.
It describes **Rare Novelties**
Which can not be had elsewhere.

W. ATLEE BURPEE & CO.
PHILADELPHIA, PA.

Six days earlier than any variety tested at the Agricult'l Ex. Grounds at Geneva, N. Y. Color greenish white; pulp tender, sweet and delicious. The only grape that ranks first both in earliness and quality. Each vine sealed with our registered trade-mark label. Send for circulars giving further information. Agents wanted. Address STEPHEN HOYT'S SONS, New Canaan, Ct.

THE GREAT AMERICAN TEA COMPANY

CHANCE FOR ALL

To Enjoy a Cup of Perfect Tea. A TRIAL ORDER of 3¼ pounds of Fine Tea, either Oolong, Japan, Imperial, Gunpowder, Young Hyson, Mixed, English Breakfast, or Sun Sun Chop, sent by mail on receipt of $2.00. Be particular and state what kind of Tea you want. Greatest inducement ever offered to get orders for our celebrated Teas, Coffees and Baking Powder. For full particulars address THE GREAT AMERICAN TEA CO. P. O. Box 289. 31 and 32 Vesey St., New York.

The Gill Engraving Co.,

39 & 41 Park Place, New York.

PHOTO-ENGRAVING by all Modern Processes.

Cuts from Photographs, Pen and Ink and Crayon Drawings, Wood Cuts, Etc., by Zinc Etching, Photo-Electrotyping and Half-Tone.

NO TREES

Found—of 1835; oldest, 1,000 acres; largest. Last and bear like **whole root trees**; see "Fruits and Fruit Trees," a new thing under the sun. At least we tried to get out of the rut. Others say we succeeded. *Am. Garden* says: Novel and *useful*. Discusses methods, stocks, whole roots, piece roots, commercial orchards, to the point. *Farmers' Call:* Chuck full of just the information one wants. *Am. Agr.:* Of *special* interest. *Farm Journal:* Very instructive. *Orange Judd Farmer:* Ably written. Affords trustworthy information for every one growing fruit of any kind. *Tex. Hort.:* The author is a hard hitter. *Farm and Home:* We commend it to all. *Rural World:* Most valuable. *Prairie Farmer:* Deserves careful study. Geo. A. Sweet, Pres't Am. Ass'n Nurserymen: No one is doing more for our true interests than Stark Bros. *Cal. Fruit Grower:* Surprising low prices. Trees (whole root and piece root), Roses, root grafts—*everything*. No larger stock in U. S. No better. No cheaper. **STARK BROS., Louisiana, Mo.**

HARDY PLANTS.

Descriptive Catalogue of 100 pages will be mailed to all applicants. Hollyhocks, Iris, Pæonies, etc., together with many NEW SORTS not before offered.

H. MEYERS,
Lock Drawer E,—Late Woolson & Co.—Passaic, N. J.

MUSHROOM SPAWN.

Best Milltrack. Of unsurp'd quality.

—FRESHLY IMPORTED.—

Can be thoroughly relied on to produce a **fine crop of the best Mushrooms.** Our stocks are the largest and **freshest** in the country. Quality guaranteed the BEST IN THE WORLD. Why spend your money on doubtful quality, when you can get the **best** at a price that will please you? We sell at **rock-bottom** prices for **first quality spawn.** By mail, post-paid, **22 cts.** per pound, Five pounds for **$1.00.** By express, Ten pounds for **$1.20,** Fifty pounds for **$5.** One pound of spawn will plant a space 3 feet by 4. **Special** prices for LARGER quantities.

John Gardiner & Co., 21 N. Thirteenth St., Philadelphia, Penna.

THE United States Mutual **ACCIDENT** Association

by its justice and liberality has won such a degree of popularity that it is to-day the largest organization furnishing Accident Insurance.

$100,000 Emergency Fund.

$5,000 Full Indemnity Preferred

Policy costs $15.00 per year.

320, 322 & 324 Broadway.

CHARLES B. PEET,
President.

JAMES R. PITCHER,
Sec'y and Gen'l Manager.

GOLD MEDAL, PARIS, 1878.

W. BAKER & CO.'S

Breakfast Cocoa

from which the excess of oil has been removed,

Is absolutely pure and it is soluble.

No Chemicals

are used in its preparation. It has *more than three times the strength* of Cocoa mixed with Starch, Arrowroot or Sugar, and is therefore far more economical, *costing less than one cent a cup.* It is delicious, nourishing, strengthening, EASILY DIGESTED, and admirably adapted for invalids as well as for persons in health.

Sold by Grocers everywhere.

W. BAKER & CO., Dorchester, Mass.

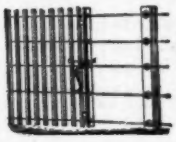
BEECHAM'S PILLS

ACT LIKE MAGIC

ON A WEAK STOMACH.

25 Cents a Box.

OF ALL DRUGGISTS.



THE GARRETT PICKET AND WIRE FENCE MACHINE

Weaves to the posts. A universal favorite. Thousands in use. Guaranteed. Freight paid. Agents are reporting big sales. Machines, Wire, etc., at wholesale direct from factory to Farmers. Catalogue free. Address the manufacturer. **S. H. GARRETT, MANSFIELD, OHIO.**

UNITED STATES NURSERIES.

CHRYSANTHEMUMS.

Fine healthy stock of all the finest varieties now ready for delivery. Send your orders in early, or write for Catalogue.

Respectfully,

PITCHER & MANDA.

PRINTING For Poultry and Stock Fanciers, Beekeepers, Nurserymen, Florists, Dairymen, Fruit Growers, Farmers, etc., a specialty. We have a large line of electrotype cuts for illustrating your work. Samples free. Cuts for sale. Envelopes, letterheads, cards, and tags from 40 cts. per 100 and up. **DeFuy's Electric Printing Works, Syracuse, N. Y.**

Garden and Forest.

Among the contents of next week's issue (No. 157) will be the following articles:

Recent Botanical Discoveries in China.—II.
By W. Botting Hemsley.

A Famous Plane-tree. (With illustration.)

Aster macrophyllus. (With figure.)

The Weeds of California.
By Professor E. W. Hilgard.

The paper will contain an illustration of the "Tree of the Janissaries" from a photograph, and a figure of Aster macrophyllus from a drawing by Mr. C. E. Faxon.

GARDEN AND FOREST.

PUBLISHED WEEKLY BY

THE GARDEN AND FOREST PUBLISHING CO.

OFFICE: TRIBUNE BUILDING, NEW YORK.

Conducted by . . . . . Professor C. S. SARGENT.

ENTERED AS SECOND CLASS MATTER AT THE POST OFFICE AT NEW YORK, N. Y.

NEW YORK, WEDNESDAY, FEBRUARY 18, 1891.

TABLE OF CONTENTS.

PAGE.

EDITORIAL ARTICLES:—An Experiment in Forestry. 73
The Forsythia as a Pillar Plant. (With figure.) 74
Recent Botanical Discoveries in China and Eastern Burma.—I., *W. Botting Hemsley.* 74
Notes on North American Trees.—XXIII. . . . . *C. S. S.* 75
NEW OR LITTLE KNOWN PLANTS:—Viola hastata. (With figure.) 76
PLANT NOTES:—Barbacenias and Vellozias. . . . . *W. Watson.* 76
CULTURAL DEPARTMENT:—Planting and Pruning in the Orchard. . . *T. H. Hoskins.* 78
Aquatics in the Flower Garden. . . . . *W. Tricker.* 78
Perennial Gaillardias . . . . . *E. O. Orpet.* 80
Notes from the Harvard Botanic Garden. . . . . *M. Barker.* 80
Freesia xanthospia. . . . . *G.* 80
Begonia Winter Gem. . . . . *A. S.* 80
CORRESPONDENCE:—Winter Notes from North Carolina. . . . . *F. H. Horsford.* 81
Winter Flowers in California. . . . . *Carl Purdy.* 81
RECENT PUBLICATIONS. 81
EXHIBITIONS:—Orchids at Short Hills, New Jersey. . . . . *S.* 81
MEETINGS OF SOCIETIES:—Iowa State Horticultural Society: Plums and Cherries for the Farmer's Orchard. . . . . *H. A. Terry.* 82
Crossing and Hybridizing for Fruit. . . . . *N. E. Hanson.* 82
Stone Fruits and Their Propagation . . . . . *Professor J. L. Budd.* 83
Forestry for the North-west. . . . . *C. F. Gardner.* 83
NOTES. 84
ILLUSTRATIONS:—Viola hastata, Fig. 16. 77
Forsythia suspensa trained on a Porch at Wellesley, Fig. 17. 79

An Experiment in Forestry.

THE Adirondack League Club, of which we have before spoken, owns a hundred square miles of timber in a compact body on the south-western outskirts of the mountain region of the wilderness. Some Beech and Black Spruce are mixed with the prevailing Birch and Maple, which here attain magnificent proportions, and scattered among them are small quantities of White Pine, Fir, Tamarack and Hemlock, besides single trees of Black Cherry and Elm, with Black Ash on the swampy land. The quality of the timber is said to be excellent; Birch-trees, which are three or four feet in diameter, as well as the tall, straight Spruces, are still vigorous and healthy. This region is within easy reach of the greatest lumber markets of the east, with waters capable of floating soft wood and a topography which admits of easy grades for roads, so that it offers good advantages for carrying on lumber operations and for intelligent forest-management. The lands of the Club have recently been inspected by Mr. B. E. Fernow, of the Forestry Department at Washington, and, if the recommendations in his report are adopted, the people of the United States will have for the first time a practical object-lesson in the management of their woodlands, according to the established principles of forestry. The tract offers a favorable field for such an experiment, for it is sufficiently large, and it contains a large amount of available and valuable material uninjured by fire, and within an accessible distance of good markets.

Bearing these facts in mind, Mr. Fernow's report is one of exceptional interest and value, in that it brings out clearly what the true function of forestry is, and it sweeps away some of the misconceptions that are almost universally prevalent, and which must be corrected before any successful forest-management can be established in the United States. Systematic forestry is a business carried on for profit in the production of wood-crops, just as agriculture is practiced for the profitable production of food-crops. Attention to this primary object does not exclude other considerations, such as the preservation of our water-supply and of certain climatic and soil conditions. Indeed, forest-management for profit and forest-preservation for other reasons may be in certain localities harmonious, but economic forestry in a wooded country means primarily the utilization of a wood-crop in such a way that the original growth, or a forest of trees superior to those of the original growth, will be reproduced with the least expense. The operations of the lumberman and of the forester differ in that the forester cuts his trees with the view to secure a desirable reproduction, while a lumberman cuts them without such forethought. The efficient management of a forest like the virgin tracts of the North Woods requires no planting unless it is desired to introduce new species, or unless clearing out and replanting appears profitable, and the most successful way of perpetuating the forest. In order to secure continued wood-crops, the forester takes advantage of the constant struggle for supremacy that is going on among the different trees of a wood. One species will gain a foothold by prolific seed-production, another by its dense shade, which will kill out its rivals, a third by a vigorous root-system, which enables it to endure the shade and bide its time until light is let in to give it aid. Different kinds of trees and the same species at different periods of its life have different needs in regard to light and other influences, and it is the practice of the trained forest-manager to assist the desirable kinds in their struggle for existence, to check the undesirable kinds and to create such conditions of soil and light as will improve the composition of the forest as it is reproduced, and secure for it the most profitable growth.

Hitherto prudent forest-management, looking toward continued reproduction, has not existed in this country, and therefore forest-property has had only a temporary value. The lumberman's practice has been to secure the valuable timber as quickly as possible, and leave the rest to rot, or burn, or deteriorate. So long as there are virgin forests to attack, the lumberman finds the greatest immediate profit in stripping one tract of its most salable timber, and then abandoning it to invade another. The owner of a large office-building will expend in repairs a part of his income from its rent in order to improve its future productive value, but the owner of a forest will not sacrifice a part of his present profit in the interest of a permanent investment. He operates his timber-tract so as to insure the quickest returns, and when it is exhausted he buys more land. Of course there must be a limit to such short-sightedness and extravagance. When that limit is reached the lumberman as we know him will give place to the forester, of whom we have heard. The man who plans for the future will supersede the man who works for the present.

This day may be nearer at hand than many of us imagine. At all events it is none too early to begin preparation for it. We have acquired great skill in the methods of forest-destruction; we know practically nothing of the best means of forest-reproduction. The ability to direct and modify and control the growth of a great forest can only be acquired by study and practice. This technical knowledge must be adjusted to the ever-changing commercial aspects of the forest as new uses are found for wood products and new markets opened. The managers of our future forests, plainly, must be men of sound judgment born of wide experience. It is to be hoped, therefore, that the Adirondack League Club will not be diverted from its purpose to carry on its proposed experiment. Let us have one example of a forest managed as a permanent investment. In other countries such ventures have proved profitable. The state forests there are not public burdens, but they help to pay the taxes, and it is not improbable that if the state of New York could buy the land in the proposed Adirondack Reservation at a reasonable price it could be made to pay as a business investment if placed under proper administration. The experiment to which we have called attention ought to furnish data which will help in

solving questions of this sort. At all events it ought to give Americans the unique opportunity of seeing a forest which is not in danger of being devastated and then abandoned, but which is looked upon as a property of ever-increasing productiveness and value—a forest in which the lumber camp and shanty and the temporary road give place to houses for constant occupancy, well-laid roads and permanent constructions for a scheme of operations which looks to the distant future. Not to speak of the educational value of such an establishment, its moral effect would not be inconsiderable. When the function of a forest as a source of production which is never to fail comes to be generally understood the public indignation at forest-destruction will be quickened. It will not seem a trifling or venial misdemeanor to fire a property which is growing in value under the expenditure of much thought and labor and money. Our forests will be guarded from destruction when the people understand how much they are worth, and an object-lesson in successful forest-management will be of signal assistance in spreading a popular appreciation of their value.

The Forsythia as a Pillar Plant.

THE illustration on page 79 represents the front of the entrance lodge of Mr. Hunnewell's estate at Wellesley, Massachusetts, draped with plants of *Forsythia suspensa*. It is published for the purpose of showing the value of this beautiful and well-known Japanese shrub for covering porches and arbors, and for training to pillars, for which purposes its long, flexible, pendulous branches admirably adapt it. There are, indeed, few plants capable of supporting the rigors of our northern winters which are so well suited to ornament the garden in this manner; and there is not in all the long list of our hardy shrubs a single one which produces year after year a greater wealth of brilliantly colored flowers and of dark-green, lustrous, handsome leaves, or which grows more freely and vigorously, or is less liable to the ravages of disease and of noxious insects. This plant is easily propagated by seed, which in some seasons is produced in large quantities, or by cuttings, which root very freely. Every branch when it touches the ground produces roots, and broad thickets are soon formed from which young rooted plants can be obtained. These planted in rich soil will grow, in the course of two or three years, into broad masses six or eight feet high.

Recent Botanical Discoveries in China and Eastern Burma.—I.

IT is now nearly eighteen months since I finished a series of articles in GARDEN AND FOREST on recent botanical discoveries in China. Since the last of that series was written Kew has received further consignments from D. A. Henry, partly from central and western China and partly from the little-explored island of Hainan, an island of considerable size in the extreme south-east of China, situated within the tropics. The collection from central and western China, mainly from the provinces of Hupeh and Szechuen, consisted of about 2,700 members, and probably not less than 1,500 species, including many new ones, to say nothing of new generic types. The collection from Hainan consisted of about 750 members, but was less interesting horticulturally. Since then, too, Forbes & Hemsley's "Index Floræ Sinensis" has been published down to the end of the gamopetalous orders, and some progress has been made with the apetalous orders. Further, the writer has assisted General H. Collett in working out an interesting collection of dried plants made by the latter in the southern Shan Hills, Upper Burma. Mr. A. Franchet has published three parts of the "Plantæ Delavayanæ," a marvelously rich collection from the province of Yunnan; and Mr. Maximowicz has made some important contributions to the flora of central Asia, north-western China and the contiguous territories from the collections of various Russian explorers, notably of Przewalski and Potanin. Although highly interesting botanically, these plants, generally speaking, are not of an ornamental character. In addition to these partly described collections, Kew has lately acquired a valuable collection made by Mr. A. E. Pratt in western Szechuen on the Thibetan frontier, at elevations of 9,000 to 13,500 feet. From a cursory examination this last collection promises to be equally as rich in novelties as any of the preceding.

When the late Dr. Asa Gray wrote on "Forest Geography and Archæology" about twelve years ago he drew some comparisons between the composition of the forests of the Atlantic and Pacific states of North America, and contrasted the American forests with the European and with those of the extreme east of Asia, eastern Mandshuria and Japan. The principal results of Gray's investigations were the relative great poverty of the forests of the Pacific side in deciduous trees as compared with the forests of the Atlantic side; the general poverty of the European forests having regard to the number of different genera and species represented in their composition, and the surpassing richness in genera and species of the extreme east of Asia, especially when taking into consideration the smallness of the geographical area. Dr. Gray computed the arboreous element in the flora of Japan and eastern Mandshuria and the adjacent borders of China to consist of sixty-six genera (nineteen coniferous and forty-seven non-coniferous) and 168 species, of which forty-five were coniferous. His estimate of the arboreous element in the European flora was just about half these numbers; but it was probably a little too low. Be that as it may, the estimate for eastern Asia was not too high; and Gray was of opinion then that the figures given were not exaggerated, and were much more likely to be sensibly increased by further knowledge than were those of any of the other regions. Subsequent botanical explorations in China have emphasized the wealth of the forests of temperate Asia. In central and western China what may be termed Japanese and Himalayan types overlap, the latter predominating. By types I do not mean identical species, for the majority are local, but species of the same genera, facies and character.

Not the least interesting among these recent collections is that alluded to above from the Shan Hills, in Upper Burma, the results of General Collett's spare moments. One of the most remarkable features in the Shan Hills flora is the predominance of plants belonging to genera characteristic of temperate regions, and this at elevations of about 4,000 feet above the level of the sea and within the tropics!

Before proceeding to an enumeration of the more noteworthy plants of the Shan Hills it may be well to say a few words respecting the climate, physical features and general character of the vegetation, extracted from General Collett's observations recorded in our joint report, which lately appeared in the *Journal of the Linnean Society of London*.

The area in which the bulk of the collection was made lies between the nineteenth and twenty-second parallels of north latitude, and is bounded on the east by the Palween River and on the west by the plains of Upper Burma, and consists of several distinct ranges of hills running north and south and rising in occasional peaks to a height of 6,000 or 7,000 feet, and enclosing table-lands of 3,000 to 4,000 feet above the sea-level. Along the western border of this mountainous region is a belt of jungle or forest of tropical composition. Up to about 2,000 or 2,500 feet of elevation the forest is dry, the soil poor, the trees stunted, and fires are of frequent occurrence. At an elevation of about 2,500 feet, and up to 3,500 to 4,000 feet, there is a great change in the character of the vegetation, owing partly to greater humidity, partly to a lower temperature. The trees are larger; Mosses, Lichens and Ferns abound; the hill-sides are covered with undergrowth, and numerous trees and herbaceous plants appear that are not found at lower levels: such are Quercus, *Schima Wallichii* and two or three of the arboreous compositæ of the genera Vernonia and Leucomeris. From the gloomy depths of this forest the traveler passes, by one step, as it were, on to the open breezy table-land intervening between the skirt of the forest and the next range of mountains; and the sensation is a pleasant one, after days of toilsome marching along narrow pathways cut through the dense jungle, where the atmosphere is stagnant and the view restricted to objects immediately at hand. Rolling grassy hills open before one, studded here and there with clumps and solitary trees of Oaks and Pines, and carpeted with low flowering shrubs and charming herbaceous plants. The presence at elevations of only about 4,000 feet of such genera as Thalictrum, Anemone, Ranunculus, Delphinium, Viola, Silene, Stellaria, Hypericum, Polygala, Impatiens, Agrimonia, Poterium, Epilobium, Œnanthe Galuim, Echinops, Primula, Swertia, Fraxinus, Pedicularis, Mentha and Ajuga will give an idea of the temperate character of the flora. Of course it does not follow that the species there found of the genera just enumerated would prove hardy in the climate of either New York or London. Indeed, the probabilities are that they would not; but General Collett collected a good many novelties that would well deserve the shelter of a greenhouse. His whole collection contained up-

ward of 800 species of flowering plants, belonging to very nearly 500 different genera and 110 natural orders—proportions only paralleled in some insular floras. It is not supposed, however, that these figures represent the true proportions of species, genera and orders in the whole flora of the Shan Hills, though the only kind of selection exercised in forming the collection was the exclusion of common and familiar weeds.

Kew. *W. Botting Hemsley.*

Notes on North American Trees.—XXIII.

45, *Rhamnus Caroliniana.*—This name of the arborescent Rhamnus of the eastern states was published in 1787. Miller, in the eighth edition of his "Gardeners' Dictionary," published in 1768, describes a *Frangula Americana*, which is perhaps this plant. Miller's description, however, can as well be applied to *Rhamnus alnifolia*, to which De Candolle ("Prod." ii., 25) doubtfully referred it. Unless, therefore, the identity of *Frangula Americana* with *Rhamnus Caroliniana* can be satisfactorily established, Walter's name should be retained.

47, *Rhamnus Purshiana.*—The black-fruited Buckthorns of the Pacific coast have lately been critically studied by Professor H. H. Rusby, of the College of Pharmacy, New York, who has contributed an important paper on the subject to the *Druggist Bulletin* for October, 1890; and by Mrs. M. K. Brandegee, the curator of the botanical department of the California Academy of Science, who has had excellent opportunities to study these plants in the field, and who has most obligingly communicated to me a large number of specimens collected in different parts of California and Oregon. The two working independently arrive at quite different conclusions with regard to the specific rank of the two plants known as *Rhamnus Purshiana* and *R. Californica.* Professor Rusby finds sufficient ground for keeping these two plants specifically distinct, and later investigations lead him to consider not only these two distinct, but incline him to give specific rank also to the pubescent form of the Mexican boundary region to the mountain form characterized by Mr. Greene as *Rhamnus rubra*, and to what seems a small-leaved form of the northern *Rhamnus Purshiana* distributed several years ago as *R. occidentalis* by Mr. Thomas Howell, of Oregon. The principal differences Professor Rusby finds in these plants are: the ordinarily greater size of *R. Purshiana*; the length of the petioles, which "are commonly two or three times as long in *R. Purshiana*," and in the leaves, in which he finds the chief distinguishing characters. "Those of *R. Purshiana*" he describes as "from two to six inches long, broadly elliptical, the base occasionally slightly cordate, but generally rounded or very slightly produced, and the apex rounded or very shortly pointed. The margin varies from nearly entire to slightly crenate and finally serrate. They are deciduous, thin and veiny; green on both sides, but somewhat paler below. The lower surface is densely and softly hairy, the veins hirsute. The upper surface is softly hairy when young, but becomes smooth, or nearly so, except within the strong channel along the midrib, which remains reddish or whitish-hirsute," while the leaves of *Rhamnus Caroliniana* "are only half the length of the last, elliptical-oblong or obovate, rounded or slightly heart-shaped at the base and occasionally short-pointed. They are often rounded at the apex, the margins varying from densely serrate to almost entire. They are thick and persistent, and generally evergreen. The under surface is strongly reticulate, reddish-veined, and the primary veins not nearly as numerous, straight or fine as those of *Rhamnus Purshiana.* Above the channel of the midrib is shallow and inconspicuous and smooth within, or there may be none. In this channel of the midrib I seem to have found an excellent characteristic." But it is in the structure of the bark of the two plants revealed by the microscope that Professor Rusby finds the unfailing guide by which they may be distinguished. "The characters and arrangement of the bast bundles, resin areas and medullary rays form quite as good evidence as do the leaf characters above detailed, and guide us to the recognition of the barks alone, which the leaf characters cannot do. The general structure of both exhibits medullary rays supported on either side with small bast bundles, circumferentially elongated, of an elliptical form. Of these there are sometimes two side by side between two medullary rays, while at other times a single large one reaches from one medullary ray to the other. In *Rhamnus Californica* they are more likely to occur in pairs. At the region where the medullary rays terminate, and extending from there to the corky layer, begins a zone of very large resin spaces of variable size and form, but many times larger than the bast bundles, which in appearance resemble them very closely indeed."

Mrs. Brandegee (*Zoe.*, i., 240), who passes over the characters based on the nature and the arrangement of the bast bundles, resin areas and medullary rays of the bark, with the remark "that their value in classification is yet to be tested, even if they hold good through large series of specimens, as in those of the writer, at least, they fail to do, and that there is no reason why these characters should not vary with age, exposure, climate and luxuriance in the same manner as the leaves do," finds that the only differences in different individuals from different parts of California consist in the form, texture and coating of the leaves, and that connecting the extreme forms are many intermediate ones, that the number of the nutlets (three in *R. Purshiana* and two in *R. Caroliniana*) which has always been depended on to separate these plants is of little value. These species, certainly, like all others of the genus, have sometimes two and sometimes three-seeded fruit. Mrs. Brandegee points out also that the red color of the bark of the branches, a character partly relied on by Professor Greene to distinguish his *R. rubra* (*Pittonia*, i., 68), is by no means unusual, plants not otherwise distinguishable being found in the same neighborhood, some with red and some with green-barked twigs. Of the southern tomentose form (*R. tomentella*), which Professor Rusby considers specifically distinct, Mrs. Brandegee says it "furnishes one of the strongest arguments for the specific identity of *Rhamnus Caroliniana* and *Rhamnus Purshiana.* It runs in the northern part of Lake and Collusa Counties into broad-leaved forms, which apparently bear the same relation to *Rhamnus Purshiana* that the southern *R. tomentella* does to *R. Californica.* It can hardly be supposed that if the species are distinct each can have a variety *tomentella* varying in the same manner as the species."

I have examined a large number of specimens gathered in all the great region where these plants are found, from the shores of Flat Head Lake, in Montana, through all the Pacific coast region to Mexico, and I confess, although it is several years since I have seen the plants growing, except in cultivation, I can find no characters which can be depended on to distinguish the described species. In all the essential characters upon which botanists depend to separate one species from another, *Rhamnus Purshiana* and *Rhamnus Californica* are the same—in external appearance of bark and in wood, in flowers and fruit, and in the color of the branches. This last is a character of little value, as in Oregon as well as in California it is sometimes red and sometimes green.

The only variation recorded in the structure of the flower is that noticed by Mr. Greene, in his *Rhamnus rubra*, the petals of which he describes as "externally setulose-hairy below the middle," a peculiarity which we cannot detect in the dried flowers he has sent to me; while the filaments described by him as deltoid are not apparently thickened at the base more than those of other flowers from California and from Oregon. Professor Rusby's character, based on the structure of the bark, would seem to require confirmation by the examination of a very large number of specimens gathered in all parts of the region occupied by this plant and from individuals growing under different conditions of soil and exposure. Until this has been done it hardly seems safe to depend upon it to separate species

otherwise not readily distinguishable. While there is no difficulty in distinguishing the extreme forms, these are connected by so many intermediate forms that it does not seem practical to characterize them specifically or even to find satisfactory varietal characters except in the case of the plant of the Mexican boundary region, which is distinct in the character of the tomentum which covers the branches and lower surface of the leaves.

In the humid atmosphere of the north-west coast-region and of the northern Rocky Mountains, where *Rhamnus Purshiana* grows in the dense shade of coniferous forests, it becomes a tree with slightly pubescent bright red or green branchlets and large, thin, broadly elliptical, obtuse or abruptly pointed deciduous leaves, sometimes hairy on the upper surface and on the principal veins below, with short pubescent petioles and prominent veins. In the less humid climate of central California the leaves are semi-persistent, usually thicker and smaller, sometimes lanceolate and acuminate. The pubescence increases as humidity decreases, the principal veins appear less prominent and their reticulation is more apparent; but in central California individuals occur in favored localities with the large thin leaves with the prominent straight veins of the northern plant, while near them are found others with the narrow coriaceous leaves of the more common California form. The California-mountain plant, with slender virgate branchlets and narrow, rather thin leaves, appears to pass, on the one hand, into the broad-leaved form of the north, and on the other into that of the California coast-region. With so many and so closely connected forms to be disposed of, the only way seems to be to consider them climatic varieties of the same species.

The species considered in this way serves to illustrate the influence of climate upon the gradual development of different closely connected forms. Abundant humidity produces arborescent habit and large thin deciduous, nearly glabrous, leaves which, as the climate becomes drier, are thicker, more persistent on the branches, smaller and more generally protected with a pubescent covering which increases in density as the amount of humidity decreases, the size of the plant decreasing also in proportion as humidity is withdrawn from it, the essential organs of reproduction being left unchanged. Very few of our trees, with the exception of certain western conifers, which seek high elevations as their range extends southward, and therefore are not subjected to very great diversity of climate, grow over as wide a range of territory of varied climate as *Rhamnus Purshiana*. Exceptions are the Negundo and the Celtis, both of these varying in different parts of the continent as remarkably as the Pacific coast Rhamnus in foliage and in pubescence.

Rhamnus Purshiana was discovered in 1805 or 1806 in what is now Montana by the members of the Transcontinental Expedition under command of Lewis & Clark. It was first described as *Rhamnus alnifolia* by Pursh. De Candolle first noticed that it was distinct from the eastern plant and described it in the second volume of the "Prodromus," published in 1825. The California plant was detected by Eschscholtz on the shores of the Bay of San Francisco in 1816, and was described by him in the tenth volume of the Memoirs of the Academy of St. Petersburg, published in 1826, so that the two plants being considered specifically the same, De Candolle's name of *Rhamnus Purshiana*, being the older by one year, would have to be adopted for the species thus enlarged.

In 1838 Rafinesque describes in the "Sylva Telluriana" his *Persoon laurifolium*, his description being drawn from a plant which he found in Bartram's Botanic Garden, in Philadelphia. It is a tree, he says, from the Oregon Mountains, with elliptical acute subentire shining, glabrous leaves; pubescent on the lower surface when young, reniform petals, and a slightly emarginate stigma. The plant in Bartram's Garden was twenty feet high, and the "berries form fine clusters and assume three colors, being by turns green, red and black when fully ripe." This is the earliest record of the cultivation of *Rhamnus Purshiana*, for there does not seem to be much doubt that it was this plant Rafinesque had in mind. Certainly there is no other tree from the mountains of Oregon which could be made to answer to the description. If Lewis & Clark, as is possible in the case of a plant of whose medicinal value they must have learned from the Indians, had brought home seed, these might very well have produced by 1838 plants twenty feet in height.

C. S. Sargent.

New or Little Known Plants.

Viola hastata.

THERE are several species among our American Violets which are rarely seen in gardens, although they possess much charm and beauty as garden-plants. Our common northern *Viola cucullata*, *Viola pedata*, the Birds-foot Violet, the charming little yellow-flowered *Viola pubescens*, and the white-flowered *Viola Canadensis*, one of the best plants which can be grown in a rock-garden sheltered by overhanging trees, are all excellent subjects to naturalize in the garden. Equally attractive, although much less well known, is the Halbert-leaf Violet (*V. hastata*, Fig. 16), which grows very locally in northern Ohio, and is found in the forests of the Alleghany Mountains from Pennsylvania to the northern borders of Florida. It is a yellow-flowered, slender, nearly glabrous species, distinguished by its halbert-shaped stem-leaves, which in one remarkable southern form are three-lobed, or even trifoliate (var. *tripartita*). This pretty plant will doubtless thrive in cultivation under the conditions which are favorable to the growth of *Viola pubescens*, to which, botanically, it is very closely related.

Plant Notes.

Barbacenias and Vellozias.

FROM the number of enquiries recently made with reference to the cultivated species of these two genera, it would appear that they are attracting the notice of horticulturists, and as many of them, particularly the uncultivated species, are of quite exceptional interest and beauty, some notes upon them may be acceptable.

They form a section or suborder of *Amaryllidaceæ*, but in general characters they differ widely from the common garden representatives of that order. Their most characteristic features are thus described by Lindley in his "Vegetable Kingdom":

"In Brazil, southern Guiana, and also in the Mascarene Islands, there occurs a race of plants which may be compared to Conestyles, of New Holland, on a gigantic scale. Martius, who calls them Vellozias, describes them as perennial Lilies, with their trunks closely covered by the withered remains of leaves, branching by forks, and bearing at their points tufts of leaves in the manner of a Yucca or Dracœna; some of them are from two to ten feet high, with a trunk sometimes as thick as a man's body. I find the structure of their trunks most curious. It consists of a central slender subcylindrical column, which never increases in diameter after its first formation, and which has the ordinary monocotyledonous structure. Outside of the column are arranged great quantities of slender fibrous roots, which cohere firmly by their own cellular surface, and form a spurious kind of wood, which is extremely like that of some kinds of Palm-wood, only it is developed by constant additions to the very outside of the stem."

Living plants of several species at Kew exhibit this remarkable stem growth, and in the Museum there are fine specimens of large stems.

The flowers of the cultivated species are large, elegant and richly colored, but they are small and unattractive when compared with some of the Brazilian species of Vellozia, which are described by collectors as forming beautiful plants with elegant foliage and Lily-like flowers from four to six inches across, their color purple, yellow, blue or white. Gardner collected specimens of some of the finest of them in Minas Geraes, and both he and other collectors state that they are common on the mountains of Brazil.

Seeds of these plants are freely ripened when in cultivation, and they may be kept at least six months without losing their

power to germinate. This has been proved this year at Kew, where seeds of *Barbacenia squamata* have been ripened. Indeed, we have proof that seeds offer an easy means of introducing these plants, in the fact that some of what may be *V. compacta* were sent to Kew by the ex-Emperor of Brazil in 1888, and that plants have been raised from them which are now eighteen inches high.

The mountains of south Brazil being the happy hunting-grounds of the Orchid-collector, it ought not to be difficult to obtain through him seeds of the most striking of these plants. Even the stems may be sent a long voyage with safety, for at Kew and also in the Jardin des Plantes at Paris may now be seen beautiful examples of a most striking species as yet undetermined, the stems many times branched, triquetrous, and clothed at the tops with bright green plicate leaves. These have been sent from Brazil within the last three years. Mr. Sander also introduced two years ago a fine specimen, four feet high, of *Barbacenia squamata* which is now at Kew, where it flowered freely all last summer.

Fig. 16.—Viola hastata.—See page 76.

According to Bentham and Hooker there are eighteen species of Barbacenia, all of them Brazilian, and fifty species of Villozia, natives of Brazil, Africa and Madagascar. Some very fine species have lately been found in this last country.

The cultivated plants of these two genera are as follow:

BARBACENIA PURPUREA. — This was introduced accidentally, seeds of it having been concealed in a small quantity of soil adhering to some epiphytes sent to Dean Herbert from Rio Janeiro. Some of the seedlings were sent to Lord Milton, whose garden at Wentworth House was at that time famous, and they flowered in August, 1827. This species is the only one that is generally known in horticulture, and even it is rare. It has a short stem, elegant grassy-green leaves, with spiny margins and tall, single-flowered scapes. The flowers have a trigonous tube, a flat, spreading limb of six lanceolate segments, colored a rich maroon-purple. What is probably merely a large-flowered variety of this is figured in Moore's *Magazine of Botany* under the name of *B. Rogieri*, which is said to have been produced by crossing *B. purpurea* with *B. squamata*. This plant is cultivated now in continental gardens as *B. hybrida*.

B. SQUAMATA was introduced from the Organ Mountains by Veitch of Exeter in 1841. It has the foliage of *B. purpurea*, but the stem attains a length of several feet and branches. The flowers are produced singly upon thin, wiry scapes, each flower being one and a half inches across and colored bright scarlet. This is almost certain to prove a most useful garden plant. It appears to have been lost from gardens until introduced to Kew last year.

B. SCHIDIGERA was introduced from Minas Geraes into Belgium by the collector, De Jonghe, in 1849, and was figured in Lemaire's *Jardin Fleuriste*, *t.* 198. It has a short stem, leaves six inches long, clothed with silky hairs, twisted and brown when old. The scapes are erect, one-flowered, and the flower is two inches long, the limb spreading and colored rich vermilion.

B. MACRANTHA was also described and figured by Lemaire from plants obtained through De Jonghe in 1853. It resembles the last-named in foliage and habit, but differs in having scarcely any flower-scape, and in the flowers being nearly twice as large. Neither this nor the last is in cultivation in England so far as I know.

The cultural requirements of Barbacenias are simple. They prefer an airy, sunny position in a warm greenhouse, an open soil such as suits *Odontoglossum crispum*, and a moderate amount of water. They seed freely, and their seeds vegetate readily if sown on peat in a warm house.

VELLOZIA ELEGANS is the only cultivated African specimen. It was introduced from the Cape or Madagascar in 1866, since when it has been in cultivation at Kew. It forms a

tuft of short wiry stems, branching freely at the base; the leaves are bright green, lanceolate, keeled, and about six inches long, and the flowers, which are borne singly on thin scapes as long as the leaves, are not unlike those of *Milla biflora* in form and size; they are at first lilac-colored, changing to white before finally turning green; they remain upon the plant several months before withering. This is a pretty little plant for the stove or warm greenhouse. It delights in sandy soil and plenty of sunlight.

V. candida flowered at Glasnevin in 1865, seeds of it having been sent to Dr. Moore from Brazil by Gardner. It has narrow-channeled, semi-erect leaves, with fine marginal teeth, and white star-shaped flowers three inches across, borne on erect scabrous peduncles.

There are young plants at Kew which may probably turn out to be *V. compacta*, which is one of the large-stemmed kinds described by Lindley, and which has flowers about six inches across, colored rich purple. There are also young plants of a Cape species, raised from seeds, but they have not yet flowered. Evidently these plants grow very slowly, and the tree-like specimens seen in Brazil and Africa are probably of great age. Of these stems might be introduced, but, failing them, seeds ought certainly be obtained for cultivation.

Kew. *W. Watson.*

Cultural Department.

Planting and Pruning in the Orchard.

ONE sees a good deal of advice offered in regard to orchard work, which, while it may be good under the conditions given, is only of value under those conditions. When we have to buy our trees from a nursery, often at a considerable distance, we must take the trees as we get them; and it is not strange, therefore, when we have to use many precautions, not in themselves essential under better circumstances. For example, take young trees grown in a highly manured soil, dig them carelessly, perhaps with a mechanical digger, leaving the roots short, with their ends so bruised that still more needs to be cut away, and the advice given to shorten in the young wood in a corresponding degree is good. Even then, it is too often the case that no growth can be expected from such trees the first season. On the other hand, if the farmer grows his own trees, or has them from a neighboring nursery, where he can have them taken up under his own inspection, he may get them with their whole root system practically intact, and can set them into the ground again within a short space of time. If this work is properly done, and the ground about the trees liberally mulched, the growth in an ordinary year will be but little checked, and cutting back wholly uncalled for.

There is a good deal being said just now about the formation of a "Nursery Trust," and perhaps this of itself will cause many who contemplate engaging in orchard work as their main business, to think seriously of growing their own stock. If this should be so, the organization of such a trust would not be without advantage. When one considers how simple a business, comparatively, the propagation of fruit-trees is, it is remarkable to note how few fruit-growers attempt to grow their trees from the start. Possibly the chief objection is found in the time supposed to be lost. This may be a good reason for buying a few trees to start with, in order to get an early supply for family use; but if home propagation is started at the same time, the orchardist will soon discover that but little time need be lost. If he is in a great hurry, he may get his stocks, or even his root-grafts (or stocks in bud), from a nurseryman; but if he at the same time begins with the seeds, growing his own stocks and grafting or budding them, experience will demonstrate to him that the loss of time is mainly imaginary.

From the necessity of the case, being without the means to buy many trees, I began in this way in my fortieth year, and expect next spring to complete the planting of a new orchard of 1,000 Apple-trees, begun two years ago, and I am now in my sixty-fourth year. Although laboring under the disadvantage of planting in a part of the country where no really iron-clad varieties were then known, and consequently having to replace nearly all of my earlier plantings during the first ten years, my oldest orchard has long been abundantly productive, even during the past unfavorable year.

The advantage of a well-managed home nursery is, first, in the knowledge acquired in regard to the character of each variety from its youth up, and second, in acquiring skill in forming the heads of the trees, so that but little subsequent pruning, other than that of a pocket-knife, will be needed. An orchard so grown from the beginning is worth many times more than one which has required and received heavy pruning in order to form a practicable top to each tree. A third advantage is in the opportunity to select the very best trees for planting. Seedling roots, even the best, differ among themselves. The union formed between stock and cion is not equally good in all cases; and there are other reasons why there is a great choice between individual trees in the best nursery, and such a choice the grower of his own trees alone has.

But greater still is his opportunity, not only to plant properly, but to take up the trees with all their roots practically uninjured and to set them out at once, with his own hands, in holes ready dug for them. Instead of being obliged to cut back all, or nearly all, of the previous year's growth, it may be left with the assurance, if the work is all well done, that a good growth will be made the same season. The cutting back at planting, so strongly insisted upon by commercial nurserymen and by most writers on the subject, is substantially a confession of the bad condition, comparatively, in which nursery trees are apt to reach the planter. "No growth the first year" has to be accepted as almost an axiomatic statement; but it will be found to have no reality when the practice I advise is carefully followed.

In the "cold north," except with the most perfectly iron-clad sorts, even the penknife cutting back of last year's growth is followed by serious and permanent injury to the young tree. The cut surface blackens, in part, perhaps, in consequence of the aphids collecting upon it, and, I have sometimes thought, poisoning the wood by thin saccharine excretion, which affords a nidus for Fungi that subsequently attack the wood. Certain it is that on dissection these cut limbs show death, and even decay, the second and third seasons; and though a thrifty growth may follow, yet, when full-bearing age is reached, an overladen limb, breaking down, will reveal advanced decay. I find this even in such a hardy variety as the Wealthy; and rigid investigation with saw and knife traces it back directly to the shortening of the young growth at planting, so generally taught by supposed experts in the business.

Newport, Vt. *T. H. Hoskins.*

Aquatics in the Flower Garden.

DURING the past few years a great change has been effected in our parks and private gardens in the style of "bedding out" toward something more natural than the ribbon border or set patterns and pictures. It has also been found that bold masses of foliage, combined with flowering plants, have a much more pleasing effect than when flowers alone are used. The Public Garden in Boston was much admired last summer, with beds of foliage plants representing the badges of the different army corps that visited that city, but there were no beds so effective or graceful as those by the side of the centre walk over the bridge, which were filled with sub-tropical foliage plants. These beds doubtless cost less labor and required less attention than the smallest of the badge beds.

Very effective groups can be made by the liberal use of aquatics, Palms, Cannas and other large-leaved and strong-growing plants. Musas are very effective in sheltered spots, where the leaves are not torn by the winds. Among aquatics the *Nelumbium speciosum*, or, as it is more generally known, Egyptian Lotus, takes the front rank. This is the largest of Water Lilies, with the exception of *Victoria regia*, but it has the advantage over the latter in being hardy, and can be grown in almost any garden. It is a strong grower and a rambler, and requires to be kept under control in the flower-garden or in the Lily-pond with other aquatics, as the roots spread so fast that it would soon crowd out all others. Almost any kind of tank will answer to grow it in, provided there is a depth of about three feet of water and brick walls or divisions to keep the plants within limit. About a foot of soil, composed of old sods and rotten cow manure, will be needed, and the planting should be done about the 1st of May or as soon as growth commences. The tank should be filled gradually with water as the plants grow, and on the approach of winter, if the water is deep enough to save the roots from freezing, it may be left in the tank; if not, the water should be drawn off, and the plants covered with leaves, salt hay, or litter to protect them. This makes a grand background in a tank where hardy and tropical Nymphæas are grown, or a stately object by itself, or in large tanks and lakes in parks. The native and hardy kinds of Nymphæa are all worthy of a place in the aquatic garden. The pink Cape Cod Lily is especially fine, and the white European Water Lily (*N. alba candidissima*) is the largest hardy white variety, a most profuse bloomer and a chaste and exquisite flower. Too much cannot be said for the new yellow variety, *N. Marliacea*, which is perfectly hardy and of easy culture. The habit of the plant is like *N. alba candidissima*.

It is a robust grower, flowering freely the entire season, with a beautiful flower, with broad petals of a light yellow color, and bright orange stamens. It is a great acquisition. These require no protection in winter, but to save the masonry-work of a tank leaves or evergreen branches or other litter may be used to cover the edges. All tropical mass. In either case it requires a good rich soil and moisture. It forms a beautiful contrast to the deep green and metallic shades of Cannas. This plant and the Egyptian Lotus have a very remote antiquity, and figure constantly as sacred plants in early Egyptian art. Both were very useful aside from their ceremonial and religious uses, the Papyrus furnishing the

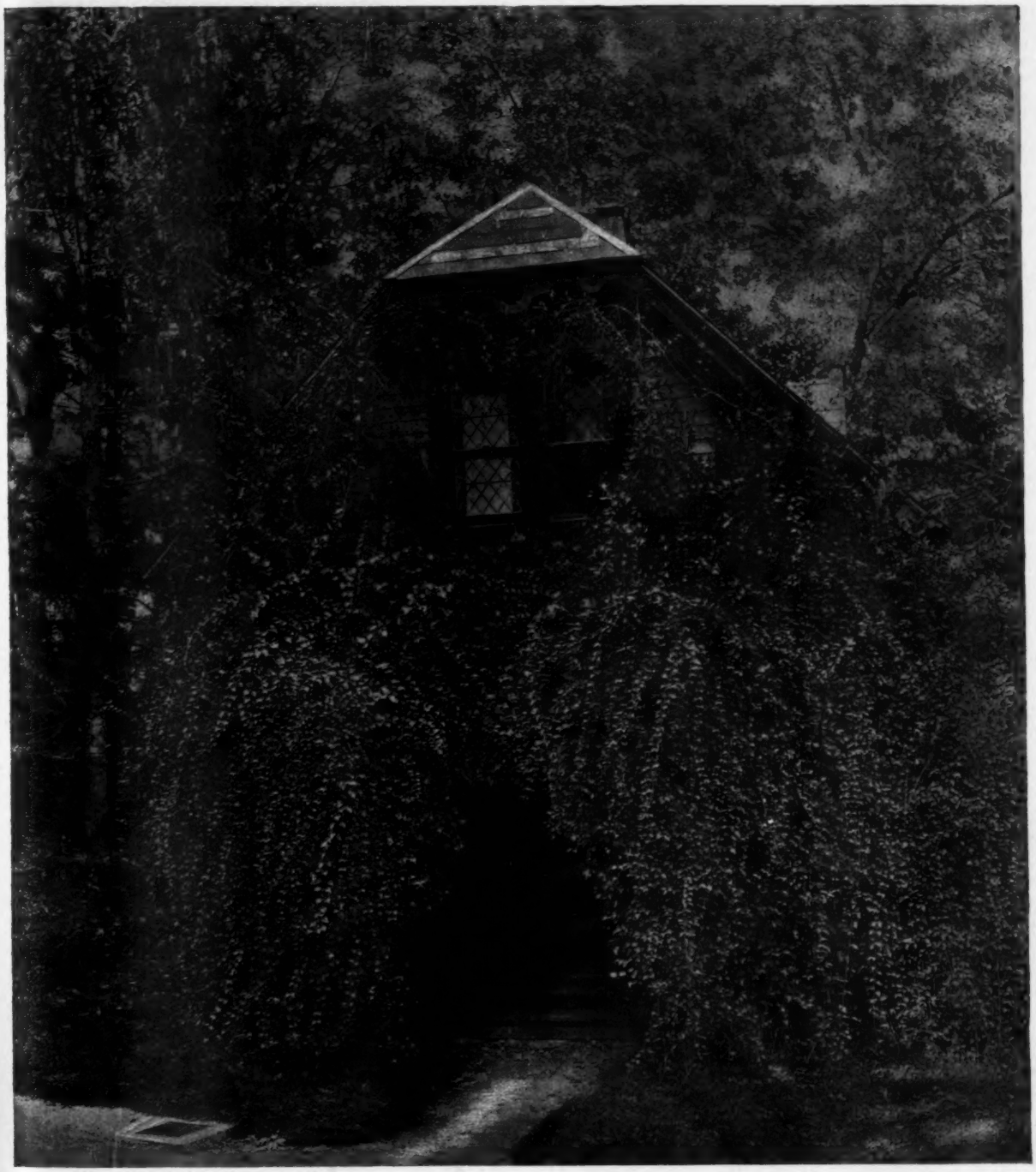


Fig. 17.—Forsythia suspensa trained on a Porch at Wellesley.—See page 74.

Nymphæas can be grown in the same tanks, either planted out or grown in tubs, plunged in the tank, but these cannot be safely planted till June, and must be taken out in the fall and protected in a greenhouse.

The Egyptian Papyrus is another very interesting plant, either to grow in water or to plant in a border grouped in a material for paper and ropes, of which samples are found in the Egyptian tombs. The Lotus-seeds were eaten and the roots cooked as we cook potatoes. The Japanese and Chinese to-day plant the Lotus in the fields after the rice has been harvested and use the roots as food. There is a tradition that the American Indians used both the seeds and

roots of the American Yellow Lotus, *Nelumbium luteum*, for food.

Associated with Aquatics and in the rear of the tank, specimen Palms, Rubber-plants, Cannas, Ricinus, Caladiums, Phormiums, with Arundos, Bamboos, Eulalias and other hardy ornamental grasses, in single plants or clumps, are most picturesque. Many other plants will suggest themselves to lovers of flowers for use near the water edge and in suitable places. Spiræas, Iris, Acorus, Sagittarias, Cyperus and others may be planted beside Aquatics that require shallow water, such as Limnocharis, Pontederia, Pestia, etc. In half-shady places some of the fine foliaged Begonias and Caladiums planted along with hardy Ferns are very beautiful. If water can be combined with rock work it will give a much more pleasing effect in sub-tropical gardening. Foliage plants can be used in a variety of ways, and some of the commonest plants can be made most effective and to harmonize with plants of greater rarity if judiciously introduced.

Dongan Hills, S. I. *W. Tricker.*

Perennial Gaillardias.

WITHIN the past few years Gaillardias as hardy plants have become well known among those who cultivate such plants extensively, but the decorative value of the perennial Gaillardias is not so generally appreciated as it should be. The ease with which they may be raised, and the short time required to secure an abundance of flowers, are strong points in their favor, and the various uses to which the flowers are adapted when cut, owing to their durability, is another reason why they should be widely grown. The perennial Gaillardias are the offspring of *G. aristata*, a North American species which is found over a wide area in the western states, and although in cultivation for a number of years, it is only recently that it has been taken in hand for development, and the results are so far most satisfactory. It is not the best way, in commencing to grow Gaillardias, to get expensive named kinds. Our first attempt at their culture was to import a dozen named varieties; the greater portion arrived dead, and those which survived were not to be compared with others obtained later from seed. To those who have not hitherto grown these plants we would say procure at once, if heat is at disposal, a packet of *Gaillardia grandiflora* and sow thinly in boxes, and, as soon as the young plants are large enough to handle, pot them off singly in small pots, and, when weather permits, plant them out where they are to stay, and they will flower the same season. There is a great advantage in potting the young seedlings, as their roots are very delicate and do not bear the disturbance which is unavoidable in transplanting when the young seedlings are placed in flats. Should any variety of special merit in the opinion of the cultivator occur, the particular one may easily be perpetuated by means of root-cuttings. To do this the plant must be carefully lifted, the roots preserved and placed in sand in the propagating bench, and, if not covered too deep and kept moist, they will speedily commence to grow and make plants that may be treated as young seedlings. We have always found all the perennial kinds of Gaillardia, including the variety known as *G. Templeana*, to come readily from seed, though the reverse has been asserted. It is just possible that seed of perennial varieties may be offered under other names than *G. grandiflora*. This need not cause any hesitation, for the hardy kinds, under whatever name, are all derived from *G. aristata*, which is, so far as I know, the only hardy perennial species in cultivation, though several others are enumerated by Gray, in the "Synoptical Flora."

South Lancaster, Mass. *E. O. Orpet.*

Notes from the Harvard Botanic Garden.

ÆSCHYNANTHUS SPLENDIDUS.—The Æschynanthuses are tropical epiphytes which require stove treatment. The stems usually trail or hang down, and they are furnished with opposite leaves. Their trailing stems render them very appropriate plants for cultivation in hanging baskets. The plant here mentioned, however, has cylindrical stems of somewhat erect, scandent growth, and elliptic-lanceolate, pale green leaves, about three inches in length, occasionally arranged in whorls of three. It is a hybrid of garden origin. The flowers are borne in dense terminal clusters. The corolla consists of a curved tube three inches long, widening toward the five-lobed mouth, which is three-fourths of an inch across, the color orange-yellow at the base and scarlet at the top, with brownish marks on the three lower lobes. The creamy white pistil, with large circular stigma, protrudes an inch beyond the corolla and adds to the pleasing character of the flower. This plant usually blooms twice a year, once early in spring and again late in summer. Every young branch will produce a cluster of the showy flowers, which retain their full-blown beauty for several weeks. The plant should be grown in a pot and trained to a rafter or trellis; it is most effective in this way. Fibrous peat, with the addition of a little rough charcoal, is the most satisfactory material for potting. Cuttings planted in sandy soil, and kept moist in a close propagating box, will take root quickly.

JASMINUM SAMBAC.—The Arabian Jasmine, as this species is commonly called, is an old occupant of greenhouses. It is a stove plant of free climbing habit, the opposite, ovate-acuminate, cordate, rich green leaves, with very short petioles, measuring between two and three inches in length. The leaves are so closely arranged upon the stem that they often overlap. The pure white, salver-formed flowers are deliciously fragrant, and they are borne in clusters of about five on the little branches, which proceed from the axil of almost every leaf on vigorous young growth. The tube is an inch in length; the limb an inch and three-quarters across, divided into about eight oblong, reflexed segments. The flowers are most abundant during the latter part of summer, but old-established plants are almost continuously in bloom. This plant is seen at its best when trained somewhat loosely to a pillar or rafter, and, although more at home in a prepared border, it succeeds very well under pot-culture. It is propagated by inserting cuttings, prepared from the half-ripened growth, in sandy soil. There are two other quite distinct varieties of this Jasmine. One of these has semi-double or double flowers; it is of decidedly bushy habit, and therefore better adapted for pot-culture than the species. The name of the remaining variety, *J. Sambac trifoliatum*, affords all necessary description of the plant.

JATROPHA PANDURÆFOLIA.—A miscellaneous collection of stove plants is much enlivened during autumn and winter by the scarlet flowers of this free-growing shrub. The stem is woody, and, unless the tip is pinched out occasionally during active growth, of a somewhat rambling character; indeed, there is a tendency toward lankiness where this course is not pursued. The alternate leaves are green above and much paler on the under side. The specific name, meaning fiddle-leaved, indicates an outline which is common to them, but far from constant. The blade of the leaf is from three to four inches in length and toothed at the base, where it sometimes deviates from the regular form in being lobed or angular. The bright flowers, with five obovate petals, are rather more than an inch across, and freely borne in terminal cymes on a peduncle four inches long. The plant was introduced from Cuba, about 1800, by Mr. J. Fraser, at whose nursery in the vicinity of London it flowered shortly afterward for the first time in England. Cuttings of the young branches root freely in sandy soil with the aid of moderate bottom heat. When rooted the plants should be potted in a mixture of loam, peat, old cow manure and sand, in equal parts, and placed in a sunny part of a house in which a stove temperature is maintained, after having been started into growth in a more shady position. *J. acuminata* is a synonym frequently met with.

Cambridge, Mass. *M. Barker.*

Freesia xanthospila.—A plant of this favorite flower now in bloom does not differ in habit from others of the family. The scapes are furnished with five or six flowers produced in succession. The individual flowers are pure white, with a small blotch of yellow on one of the segments. The segments are narrower than in *F. refracta*, spike-shaped, narrowing abruptly into a long and rather slender tube. The flowers are rather more graceful and elegant than those of the more common species. *F. refracta alba* is now a very popular flower and widely cultivated, as it is so easily managed, but it seems to be inconstant in its markings; some forms are entirely white, and others vary from a slight blotch of orange at the base of tube to a considerable marking on the segments. *F. Leichtlini*, which also varies from this variety in its form, is usually suffused with orange-yellow in all its parts. *F. Fosteri* seems nearly, if not quite, identical with this variety, but is said to bloom later.

Elizabeth, N. J. *G.*

Begonia Winter Gem is one of several useful winter-flowering hybrids raised by Messrs. Veitch by crossing *B. Socotrana* with others. It was exhibited in beautiful condition by the raisers at a recent meeting of the Royal Horticultural Society, and proved its superiority over almost all other Begonias by the way it has weathered the fogs and darkness of this winter. The plant is scarcely a foot high, and it has rich, glossy green leaves and graceful, almost erect, scapes of regular bright crimson flowers. A peculiar character of *B. Socotrana* and all hybrids from it is that of retaining their flow-

ers until they wither. I have seen Begonia Winter Gem and its brother hybrid, Begonia John Heal, bear their flowers fully six weeks before they fade.

London. *A. S.*

Correspondence.

Winter Notes from North Carolina.

To the Editor of GARDEN AND FOREST:

Sir.—The Yellow Jasmine (*Jasminum fruticans*), a low shrub from southern Europe, has been constantly in flower for two weeks or more, notwithstanding the coldest night of the winter came within this time. *Spiræa prunifolia* also showed a few flowers in January. Shepherd's Purse (*Capsella Bursa-Pastoris*) and the little Dead Nettle (*Lamium amplexicaule*), so common in some gardens of southern Massachusetts, are also in bloom. I observed one plant of the Trailing Arbutus (*Epigæa repens*) and one of *Asarum Virginicum* in full flower; but the former was well budded, and our New England plants would have bloomed with half as much mild weather. Both of the Hepaticas grow here (*Anemone acutiloba* and *A. Hepatica*), but with handsomer mottled and colored leaves than those farther north, owing, no doubt, to their being so much exposed to the sun in winter. They do not bloom here, however, in the first warm sunny days, as plants in New England do, but seem to wait for the proper time, whatever the weather may be. And this seems to be the habit of most native plants here. The same number of warm days in New England, with no frost in the ground, would bring out almost all of our first spring flowers.

Both of the species of Ginger Root common to this locality (*Asarum Virginicum* and *A. arifolium*) are scattered through the woods of the lower elevations. Nowhere abundant as *A. Canadense* often is in New England, but almost everywhere, in moist, well drained, shaded soil, a sprinkling of them will be found, with their shiny, mottled green leaves as handsome as at any season. Several troublesome weeds here are sometimes cultivated north. On dry, cultivated soil, in places, the Passion Flower (*Passiflora incarnata*) is as common as the Canada Thistle is in parts of northern New England. The Cypress Vine (*Quamoclit coccinea*), Small Morning Glory (*Ipomea Nil*) and *I. lacunosa* are troublesome weeds in many cultivated fields. On the mountain-sides the Wild Potato Vine, or Man-of-the-Earth (*I. pandurata*), is abundant.

One species of the Greenbrier (*Smilax glauca*) is very abundant here, its leaves and fruit often persistent through the winter. The leaf is ovate, and sometimes cordate in outline, and turns to a reddish purple. These, with its black grape-like fruit, which it sometimes bears in great abundance, make the plant an interesting one as seen growing along the margins of thickets, but one who tries to penetrate these thickets, and finds himself arrested by its stout prickles, soon loses his admiration for its beauty. There are places, no doubt, where it might be used to good advantage, but the possibility of its spreading beyond its intended bounds might overbalance its merits.

The American Holly (*Ilex opaca*) shows the handsomest foliage of any native tree I have seen here. It is not abundant, but scattered specimens are found along the bottoms of ravines in which brooks flow, and also occasionally in the open country along the margins of streams. I have seen only two or three specimens in fruit. The severe frost of last March seems to have prevented its fruiting.

Lynn, N. C. *F. H. Horsford.*

Winter Flowers in California.

To the Editor of GARDEN AND FOREST:

Sir.—The earliest herald of the new year here is the Chinese Narcissus. Mongolian washermen are quite liberal with their national flower, and many specimens, after having blossomed once in water, have been turned out-of-doors, and blossom annually in the open border. They have been in flower now for several weeks. To-day one of my Trumpet Major Narcissus is in bloom. The Violets commenced to blossom when the cool weather set in. They have kept flowering ever since, and now are quite full. The Pansies, too, and a bed of Verbenas, in a warm situation, have bloomed in a desultory sort of a way all winter, and now present quite a bright appearance. A plant which seems strangely out of season is a Polyanthus, which threw out stray flowers late in the fall and is still in blossom. The Roses, too, feel the influence of the warm spell, and their buds are swelling. There was a Rose carnival at Pasadena, in the southern part of the state, about the New Year, but we wait till May for our Roses.

Ukiah, Cal. *Carl Purdy.*

Recent Publications.

Die Krankheiten und Beschädigungen unserer landwirtschaftlichen Kulturpflanzen. Von Dr. Oskar Kirchner. Stuttgart, 1890. 8vo, pp. 637.

The number of treatises on plant diseases which have appeared in Germany in recent years is so large that one could hardly expect any novelty in the method of treating the subject. In this well-printed and neatly bound volume the author has, however, arranged his material on a plan which differs considerably from that of previous works. In the first part, under the heading of Grains, Fodder-plants, Fruit-trees, etc., are arranged the principal plants known in the agriculture and horticulture of Germany, and under each species is given a popular account of the more frequent morbid appearances, as spots, distortions, tumors, etc., with the name of the fungus or insect which causes them. The plan might be called a dichotomous key to morbid appearances, and, except in its more detailed character, resembles the synoptical keys common in botanical manuals. A key to morbid appearances is, as far as we know, quite novel, certainly on such a large scale as the present. The second part of the book is a condensed account of the principal genera of injurious fungi, with a few genera of parasitic phænogams, and the genera of injurious worms, insects and snails. Under each genus is a description of the species mentioned in the first part of the book, cross references being made by bracketed numbers.

The plan is certainly simple, and, if practicable, the work must be of good service to those who have little previous knowledge of fungi and insects. Whether really practicable or not experience alone can decide. But fungi are so numerous and complicated that it may perhaps be doubted whether the unlearned reader could be supposed to follow the key with any great degree of confidence. If it should happen, as might easily be the case, that he had before him something not in the key, he would go hopelessly astray. For those who know something of fungi, the present key is cumbersome and less accurate than other methods found in previous works. Since there are no figures to aid the beginner, and he must depend on the text alone, we shall look with interest to know whether in practice the plan works well, for, if it proves to be a good one, it is likely to be adopted by future writers.

Exhibitions.

Orchids at Short Hills, New Jersey.

ALL last week the United States Nurseries were receiving visitors at the invitation of the proprietors, Messrs. Pitcher & Manda. Many persons from distant cities were there, and every one was repaid for the journey by the abundant display of Orchids in flower. In the chain of houses, 425 feet long, the Cypripediums were most numerous, the plants in flower numbering a scant dozen less than 700, while the Cattleyas flowering in brighter groups mustered 567 strong. These numbers give some idea of the extent of the exhibition, while the neatness of the whole, with the skillful arrangement and perfect health of the plants, made it unusually attractive in quality throughout.

In so extensive a collection, it is, of course, impossible to name all the plants of special merit. The 126 varieties of Cypripedium in flower, for instance, would naturally include most of the standard sorts which flower at this time. Perhaps the searcher for novelties would be most interested in the varieties Electra, Pitcherianum and Galatea, all good in their different types, and all flowering now for the first time in this country. Some hybrids between *C. venustum* and *C. Boxallii* were interesting. They were raised in this establishment, and the extent to which the production of new seedlings is carried on is appreciated by the visitor when he is introduced into a house where 1,700 seedlings are growing. Some of the Cypripediums are coming into bloom now about two years after the seed was sown. One of the hybrid Dendrobiums raised here is now in flower. It is from *D. Rukeri*, fertilized by *D. nobile.*

Other noteworthy Dendrobiums in bloom were the rare white form of *D. densiflorum*, large specimens of *D. thyrsiflorum* and *D. Wardianum grandiflorum.* There were fine varieties of *D. Ainsworthii*, and the variety *Wallichianum* of *D. nobile.*

The pick of the Angræcums was a large specimen of *A. sesquipedale*, with seven of its great white star-like flowers open at once. A good plant of the white variety of *Cælogyne cristata*, and some fine varieties of *C. flaccida* were the attrac-

tions offered by this genus; and among Cymbidiums there were good specimens of *C. giganteum*, *C. Lowianum* and its dark purple variety. The choice Cattleyas were varieties of *C. Percivalliana*, one specimen showing twenty-seven flowers, and some exquisite forms of *C. speciosissima*.

About the best of the Masdevallias in bloom was the large-flowered variety of *M. Veitchiana*, and the best of the Lycastes were some plants of *L. plana* and the ever-pleasing white variety of *L. Skinneri*. There were some fifty fine Odontoglossums in flower, one of them a grand specimen of *O. Pescatorei*, and some specially elegant varieties of *O. crispum*. The best Oncidium was a really splendid plant of *O. splendidum*, and of the Phalænopses a specimen of *P. Schillerianum*, with a spike thirty inches long and bearing thirty-four flowers, took the lead, followed by good specimens of *P. Stuartiana* and *P. amabilis Dayana*. There were many other things besides Orchids to see, but these plants should not be left without mention, of a magnificent specimen of *Vanda gigantea*, some fine examples of *V. tricolor* and Rollins' variety of this species.

Outside of the Orchid houses the visitors found the greatest delight in the long structure, where they walked under an almost interminable line of arching fronds of Tree-Ferns and the spreading leaves of great Palms, with Musas, Dracænas, Encephalartos and other plants grown for graceful effects of foliage. The houses branching off from this were each devoted to some special plants—one to Anthuriums, another to *Pandanus Veitchii* and Dracænas, a third to Camellias and Azaleas, a fourth to Cocos and Kentias, and so on. Perhaps the most interesting of these contained a broad central bench, devoted throughout its entire length of a hundred feet to Araucarias. The middle row of these was of a uniform height of some four feet, the outer rows growing shorter toward either side. The perfect evenness of the plants, with the delicate texture and color of their foliage, made a long, regular mound of soft green which was strangely beautiful.

New York. *S.*

Meetings of Societies.

Iowa State Horticultural Society.

THE twenty-fifth annual meeting of this Society, at its rooms in the state capitol at Des Moines, was largely attended, and although a series of severe winters has given a check to fruit-growing in the state, and many orchards have been killed, yet two mild winters have once more given good fruits and renewed hope. The apple industry in parts of southern Iowa is now fairly prosperous, and there are many large commercial orchards there. In northern Iowa, aside from some of the new Russian varieties, only the Oldenburg, Tetofsky, Wealthy and Whitney Number 20 can be recommended for general planting. The sum of $2,000 was appropriated by the Society for horticultural experimentation next year, and it was decided to continue on an enlarged scale the work of last year in crossing and hybridizing, with the hope of producing varieties of fruits which are better adapted to the various climates of the state. The following officers were elected: President, Eugene Secor; Secretary and Director of Experiment Stations, G. B. Brackett; and Treasurer, Henry Strohm.

PLUMS AND CHERRIES FOR THE FARMER'S ORCHARD.

Mr. H. A. Terry, of Crescent City, Iowa, delivered an address on this subject, from which we make the following extract:

"It is a well-known fact that the Sweet Cherry and the European Plum have not been grown successfully on the fine loam soils of the west, but on the clay soils on the eastern side of the state they are grown quite successfully. I have been experimenting for several years with many varieties of Plums, but my main successes have been with the American varieties. I have much faith in some of the Russian and Japan varieties, however, as they seem much hardier in tree and fruit-bud than any of the older European varieties. The following list of American Plums I can recommend for general planting in the farmer's orchard, and the names are arranged in the order of their ripening: Milton, a new variety, and the earliest of the Chickasaw class, has large, bright red fruit. The tree is a fine upright grower, very hardy and productive. Wild Goose is the well-known variety next in earliness, and very good for culinary use. Forest Garden follows close after Wild Goose, and is a fine dessert or cooking fruit. The tree is a strong grower, perfectly hardy and wonderfully productive. The fruit is a light mottled red, with a very thin skin, and is superior for canning. De Soto is a native of Wisconsin, with large yellow fruit, which becomes red when over-ripe. It is excellent in quality and unexcelled for canning. Rollingstone originated in Minnesota. The tree is hardy and productive of medium-sized free-stone fruit of excellent quality. The Wolf is a strong, rather upright grower, very hardy and productive of large, rather dark red, firm, free-stone fruit of good quality. Hawkeye, another new variety, has done well wherever it has been tried. The tree is a vigorous grower, upright while young, but becoming more spreading with age, very hardy and productive. The fruit is of largest size and finest quality; it is light red, mottled with darker red; the whole fruit becomes dark red when fully ripe. The firmness and large size of the fruit make it very desirable for canning. Forest Rose is a late variety, with fruit of good size and good quality. The color is dark red, like that of the old Miner, of which it is a seedling. It bears abundantly, and the fruit keeps well. Maquoketa is another seedling of Miner, with fruit a trifle larger than its parent, and is one of the best for culinary purposes. If the farmer wishes to prolong the plum season he should plant a few trees of the Moseman, probably the latest variety in cultivation. The fruit is only medium in size, of a bright shining scarlet, and it ripens in early October, but will keep fresh until November. The tree is vigorous and most productive. The fruit is not of the first quality. Its chief value consists in the lateness of its season and its great productiveness.

"The list of really valuable Cherries is not a long one, but two or three of the old sorts would pay to plant, even if one has to replant, say every ten years. Early Richmond, Dyehouse and English Morello are all good varieties, but are not long-lived trees, and will require to be renewed every ten or twelve years. The Russian varieties that have been sent from the State Agricultural College seem to be hardier and more enduring for our severe climate. Among the most promising varieties so far in our state is the Wragg, introduced by Mr. John Wragg, of Dallas County. The fruit is a little larger than English Morello and of fine quality. Another Russian variety is a hardy and handsome tree, with fruit of finest quality, which ripens eight to fifteen days earlier than Early Richmond. The cherries are large, light red, and they hang on stems two to three inches long in a convenient way for picking. If it has a name I do not know it."

CROSSING AND HYBRIDIZING FOR FRUIT.

An address on this subject was delivered by Mr. N. E. Hanson, who did much practical work in this direction under the direction of the Society last year. He said:

"Much excellent work has been done in improving flowers, garden vegetables, grapes and some of the small fruits by hybridizing and cross-breeding, but comparatively little work has been done with the orchard fruits, because results are not so quickly reached, and we have been satisfied with chance seedlings and allowed insects and the wind to do most of the work for us. But the peculiar climate of the north-west requires especial care in originating new varieties better adapted to this vast region. The indiscriminate sowing of seeds is an expensive lottery. Breeders of animals select the parents, why should not breeders of plants do the same? Crossing and hybridizing plants is a method of abridging the process of evolution by introducing new elements of variation. The primitive types peculiar to each region should be used, if possible, for one side of the cross to impart hardiness, because they have become fully adapted to the environment by centuries of selection. The cultivated types should be used to impart size, beauty and quality of fruit.

"In conducting a series of experiments in crossing fruits for this Society last year I adopted the following general method: About twenty-four hours before the flower opened the stamens were removed with a pair of small forceps or pincers, such as are used in botanical laboratory work. In practice, only the anthers are removed, leaving most of the filaments. Generally, only two flowers in each cluster of Apple-blossoms were operated upon; the others were removed. Blossoms growing on a strong spur were preferred to those near or at the end of a limb. Most, or all, of the petals were removed to give easier access to the stamens. A one-pound thin manilla paper sack, with bottom squared so it could stand on a level surface, was then used to cover the blossoms and protect them from insects and foreign pollen. The next day the sack was removed, pollen applied to the stigmas with a camel's-hair brush, and the sack replaced. This time it

should be fastened with fine wire, such as is used for nursery-tree labels, because pins fail to hold the sacks satisfactorily in heavy storms. In about two or three weeks the paper sack should be removed and a sack of mosquito netting substituted. The paper sacks will withstand the ordinary wind and rain storms of an entire summer and fall, but the fruit does not hold on as well as when mosquito-netting sacks are used, soon after the fruit has set, to give access to sunshine and air.

"In crossing Grapes, from fifteen to thirty flowers were left in each cluster. I found that pollenizing could be performed to good advantage by taking clusters of bloom just opened and fastening them with string and fine wire in close proximity to the emasculated clusters. This was much easier than gathering the pollen and applying it with a camel's-hair brush. Paper sacks were used until the grapes were well set, then mosquito netting.

"The principal work was with the native Crab (*Pyrus coronaria*). The two representatives of this species used were a large-fruited variety growing on the grounds of Mr. B. A. Mathews, at Knoxville, Iowa, and the Soulard Crab. Pollen was applied of the following fourteen varieties: William's Favorite, Jonathan, Ben Davis, Pound Sweet, White Pippin, Willow Twig, Roman Stem, Summer Pearmain, Grimes' Golden, Red Stripe, Haas, Mother, Munson's Sweet, American Beauty or Sheriff. Sixty-eight fruits were obtained, containing 235 seeds. The hope is that we can combine the hardiness of the wild Crab with the size, quality and color of the cultivated Apple. If this be not accomplished by the first crosses the work is to be continued, using these as a foundation.

"The work with the Soulard was done near Des Moines, and its pollen was applied to the Red Stripe, Summer Pearmain, Ben Davis, Jonathan, Early Joe, Haas, Plum's Cider, Lowell. One hundred and forty-one fruits, containing 590 seeds, were obtained.

"The general theory followed in this work is that hardiness is imparted by the seed-bearing parent; quality and size by the pollen-bearing parent. But, to test the theory, Rawles' Janet was pollenized with Mr. Mathews' Crab, and twenty-nine apples, containing 111 seeds, were obtained. With the Raspberries the chief aim was to combine the earliness of Tyler and Marlboro with the size and quality of Shaffer's Colossal and Antwerp, and to improve the color and shipping qualities of Shaffer's. With the Blackberries the aim was to increase the hardiness and improve the fruit and habit of growth. The wild Blackberry was crossed with Snyder and Stone's Hardy, and the cultivated Blackberry with Lucretia and Windom Dewberries. The purpose is to obtain a variety with fruit as large as the Lucretia Dewberry or Erie Blackberry, and with a half-reclining habit, so as to keep the berries out of the dirt, and yet make winter protection easy where that is necessary; also to combine the hardiness of Snyder with the quality of Taylor's Prolific.

"The Blackberry and Raspberry were hybridized, and berries of both were obtained. These two species have been united before this by Saunders, Carman and others, but, so far as I know, no valuable variety has been obtained. The union appears to be too violent. But the plants produced have not all fruited, and, perhaps, success may yet be attained. Probably the best results will be from seedlings of these hybrid fruits; that is, by partial reversion the plant will be largely of one species, but retaining some desirable characteristic of the other species, thus giving it a special value.

"With Grapes the plan was to combine the earliness of Worden, Cottage, Champion and Moore's Early with the fine quality of Empire State, Salem, Agawam and Vergennes. Worden was the chief variety used as the pistillate parent, because it combines, in a pre-eminent degree, hardiness, earliness and productiveness."

STONE FRUITS AND THEIR PROPAGATION.

Professor J. L. Budd, in speaking on this subject, said that none of the varieties of Cherries first introduced into Iowa from south-west Europe have proved really satisfactory except in a few favorable locations. Some of the varieties introduced by the Iowa Agricultural College from north-east Germany and Russia promise well in parts of Iowa and the north-west, where the older varieties have failed to live. As for propagation of the Cherry, root-grafting on Mazzard is better here than budding on Mahaleb. Promising hardy stocks are *Prunus Pennsylvanica*, *Prunus pumila* and east European forms of the Morello. European experience favors growing all the stone fruits on their own roots, especially from root-cuttings. Successful experiments in growing stone fruits from short root-cuttings have recently been carried on at the Iowa Agricultural College. The Myrobalan, Black Damson and St. Julien have proved failures as budding stocks for the Plum in the west, because they are not hardy and are liable to root-kill in the nursery. Native Plum stocks of the type of De Soto, Wolf, Wyant, Hawkeye, etc., are the best stocks obtainable for western use for the native and foreign varieties.

Sun-scald and gumming of the stem can be avoided in a large measure by growing the trees in bush form with very low stems, those not more than a foot high being preferable. Trees on tender stocks should be set from four to six inches deeper than they stood in the nursery, to protect the roots and to encourage the emission of roots from the scion. One-year trees of the stone fruits are best for planting in orchard. Regular bearing is promoted by mixed planting of several varieties to insure better pollenization of blossoms.

FORESTRY FOR THE NORTH-WEST.

The following extracts are from the address of Mr. C. F. Gardner, of Osage, Iowa:

"In a prairie region like ours it is useless to plant trees until the sod has been turned and completely rotted and the soil mellowed. On an open prairie the first requisite is protection against winds. The ground for shelter-belts should be prepared first, and rapid-growing evergreens planted. My plan is to plow a strip not less than a rod wide, enclosing the area to be planted in forest. I go over this strip with a pulverizer until the soil is in fit condition to plant Onion seeds, and then plow a deep furrow, perfectly straight, on the line of the proposed hedge-row. In this furrow I set the trees, digging deeper with a spade when necessary, so that the trees will stand a little deeper than they grew in the nursery. Trees about eighteen inches high that have been transplanted should be chosen.

"I would recommend the following selection of shelter-trees in the order of their merit: White Pine, Norway Spruce, White Spruce, Scotch Pine, Red Cedar and Arbor Vitæ. Plant White Pine or Scotch Pine not more than two feet apart in the row, the other varieties not more than eighteen inches. This gives a chance, in thinning, to leave the Pine at eight feet apart and the others six feet. The thinning must be done before the plants begin to crowd; either transplant them or cut them out.

"After planting the ground should be kept absolutely free from grass and weeds; but it should be cultivated very shallow, never more than two inches deep, and less than that if possible. Go over this belt with a hoe as many times as necessary during the season.

"After the wind-break is started prepare the enclosed area for the planting of forest-trees. Free the surface from all clods, corn-stalks and rubbish. Mark off, in rows four feet apart, rows running east and west. Plant no tree within twenty-four feet of the wind-break already planted. This space should be planted with Corn, Potatoes or Beans. By planting in this way the wind-break or the forest-trees will never be broken down by drifting snow. In winters where the fall of snow is heavy, accompanied with high winds, it is not unusual for the snow to pile up from twelve to fifteen feet deep on the side of the wind-break opposite the direction from which the wind comes. Such volumes of snow are extremely liable to crush everything beneath them, as we have found to our cost.

"The Black Walnut, Butternut and Ash should be interspersed with the other varieties, as their foliage is not dense enough to properly shade the ground during the earlier stages of their growth. Always plant two or three times as many seeds as the number of seedlings you desire, for there is always a loss from mice, birds, accidents, etc. The trees should stand, at the end of the first year, not more than six or twelve inches apart. The end to be attained at first is to have the ground completely shaded as soon as possible. When this is secured, at all stages of growth thereafter, the thinning process should be so conducted as to keep it covered. At the end of the second year the plants ought to be thinned to two feet in the row."

Upon the same subject Mr. M. E. Hinckley said that there was little waste land in north-western Iowa, and while each acre in grass or grain yields immediate income people will not plant timber extensively, and yet, except in the newer sections, it is rare to see a farm without some trees. One to five, and sometimes ten, and rarely twenty, acres are found in groves. These groves are composed almost entirely of native trees, with some White Willow and Catalpa. Trees on low land are noticeably most vigorous. The Black Walnut bears when ten years old, and the White Ash at fifteen years gives a stick fit for a wagon tongue. Two acres of Maple and Willow furnish a family with fuel for a year, renewing itself as needed. The Catalpa comes short of expectation, and its introduction in this

region was probably a calamity, for if the money and labor expended upon this tree had been directed to other species we should have had something more valuable.

The errors of the past have been a neglect of proper cultivation and thinning, either of which is ruinous. The obstacles to interest in forestry are: (1) Remote profits; few people are making investments for their children when there is no certainty that real estate will remain in the family. Indeed, when the proverbial restlessness of the American citizen is considered, the probabilities are the other way. (2) The tenant system of land cultivation, which is on the increase. (3) Recent losses by drought have discouraged planters. Thorough cultivation, or if this is not possible, a heavy mulch of straw as a substitute, will alone secure success.

Mr. John Wragg said that for Iowa farmers a shelter belt could be most rapidly and cheaply grown by planting one row of Norway Spruce and one of Scotch Pine. One of these makes a rapid upright growth, while density is secured by the other. A more beautiful belt is made by planting two rows of White Pine and one row of White Spruce, the latter on the leeward side. Care should be taken, however, that the Black Spruce, an altogether inferior tree, is not substituted for the White Spruce. Red Cedar yields the quickest returns for posts, and the Larch is the best for the many uses which farmers have for small straight timber.

The most valuable Grapes for the west, according to Hon. Silas Wilson, are seedlings of Concord, and, named in the order of their value, these are Worden, Moore's Early, Lady, Pocklington, Cottage, Martha, Hayes, Woodruff's Red, Moore's Diamond, with Esther, Colrain, Rockwood and Eaton as promising seedlings. Among the promising seedlings recommended by Mr. T. V. Munson, of Texas, are Brilliant, George W. Campbell, Romel and Hermann Jaeger. Of sixty varieties fruited last year, Mr. Wilson names for his region the following as the best six: White, Moore's Diamond, Pocklington and Lady; black, Worden, Moore's Early and Cottage.

Notes.

Of the varieties of Beans tried for forcing at the Experiment Station at Ithaca, New York, Sion House was found superior to any of the other varieties tried in compact and rapid growth, earliness, productiveness, and long, straight, symmetrical pods.

Two years ago some tests were made at the Cornell Experiment Station to ascertain whether deep-set Cabbage-plants were superior in any way to those set at their natural depth. No appreciable difference was observed. This year two hundred plants of the Early Wakefield Cabbage were set in six parallel rows, every other row containing plants set at the same depth as they stood in the seed-bed, while the alternate ones contained plants set with the first leaves even with the surface. In a heavy clay soil without fertilizers the shallow-set plants gave an average of eighty-five plants to the hundred which produced solid heads, while the deep-set plants gave only seventy-seven solid heads to the hundred. The heads of the former also weighed twelve per cent. more on an average than the others.

The disease known as the yellows is decreasing in Michigan, and the planting of Peach orchards is increasing. In Maryland the disease is said to be rapidly on the increase. This indicates that the Michigan law, which seems to have been vigorously enforced, is having a good effect, and tends toward the eradication of a malady which so far has proved incurable. It has been held by many people of southern New Jersey, as well as of the Chesapeake peninsula, that the yellows could be cured or, at least, held in check by the use of proper fertilizers, but the experiments of Dr. E. F. Smith, the special agent of the Government, who has made more than a hundred tests and tried all the remedies recommended, seem to make it clear that no treatment of this kind can be trusted either to cure or prevent the disease. It appears, therefore, that it is only by a rigid law, which is enforced by a strong public sentiment, that the Peach industry can be saved from ruin.

One of the best collections of greenhouse and other plants in the neighborhood of New York is in the garden of Mr. William Brown, of Flatbush, Long Island. It is always accessible to visitors, but on special occasions it is thrown open to the public, and an admission fee is charged, the proceeds being devoted to some charitable object. No expense is spared at such times to give a gala appearance to the place, and preparations for an exhibition in April are now being made. The beneficiary in this case is to be the Home for Destitute Children, which will undoubtedly receive a handsome sum. At the grand Chrysanthemum exhibition, held last autumn at the same place, nearly $1,500 were received for charity. The main feature of the April show, besides a great display of Orchids, will be an immense collection of Ixias, Sparaxis, Calceolarias and bulbous plants in bloom. We mention this as an example which is not unworthy of imitation by other gentlemen who have extensive greenhouses and grounds.

The work done at the New Haven Agricultural Experiment Station has long been favorably known, especially in the line of chemistry. Since the appointment of Professor Roland Thaxter as Mycologist excellent work has also been done on the subject of plant diseases. The report for 1889, issued in 1890, contains an interesting account of Fungi which attack Onions, an important crop in Connecticut. Professor Thaxter gives a detailed notice of the smut (*Urocystis cepulæ*), describing the germination of the spores, which he was the first to observe, the relation of this species to other species of Urocystis. He then considers the means of checking the disease, and shows by photographic reproductions the favorable effect of different chemical substances. He also discusses other Fungi injurious to Onions, and gives notes on Fungi injurious to other crops in Connecticut, the mildew of Lima Beans, caused by *Phytophthora Phaseoli*, Thaxter, a species related to the potato-rot, being especially interesting. A recent bulletin, issued last December, has a preliminary account of the potato-scab as it occurs in Connecticut. Professor Thaxter finds that in his region the scab is not due to the attack of a specific bacterium, as is supposed to be the case in the scab found in some other regions, but by a minute fungus which, except for its apparently true branching and aërial fructification, resembles in some respects certain of the polymorphic bacteria, but cannot as yet be referred to any described form and answers to no generic description.

The *North-western Lumberman* says: "For several years certain Germans have been experimenting with a view to using sawdust as a material for mechanical purposes. It was discovered years ago that vegetable fibre, after subjection to certain chemical action, and afterward to a pressure sufficient to expel all liquids from it, could be made into a substance almost indestructible by the elements, and of great utility in the mechanical and ornamental arts. The only trouble has been from the fact that but a few kinds of fibre were capable of the transformation under any existing formula. It might almost be said that there was only one fibre that, so employed, produced results satisfactory in respect of economy of manufacture and beauty and usefulness of the resulting product; and that one fibre is cotton, its delicate structure, strength and ready submission to the action of the necessary chemicals keeping it almost alone in its adaptability for the purpose. Thus far, almost the only result has been the manufacture of celluloid, which is unsuitable for anything but the finer mechanical uses. Scientists claim, however, that all vegetable fibre is, to a certain extent, identical—that is, having its essential constituents in common, there must be some means by which the coarser kinds can be transformed into similar substances. The experimental processes have included nearly the entire list of common vegetables, but within the last few years attention has been specially directed to the waste products of the saw-mill, especially the dust. The first results were the production of paper-pulp. But as only certain species of timber could be used satisfactorily for that, the experiments have been continued further with a view to not only using any kind of sawdust, but to broaden the field, so as to produce a substance that can be used for more general purposes than paper or celluloid, and which should, if possible, combine the best characteristics of both substances. A German scientific journal professes to give the results of the experiments in that country thus far. It claims the production of a substance made from common sawdust, by means of an acid process, that promises to be of great value. It is described as being exceedingly firm of texture and of great hardness, incapable of being bored by a common gimlet or of being penetrated by a nail, more impervious to the action of the elements than the ordinary metals or the common building stones, and practically indestructible by fire, a Bunsen burner simply charring the exterior surface. It is claimed to be stronger than timber for joists and girders and several times lighter than iron or steel, and, above all, the cost of manufacture is claimed to be so low as to bring it into competition with both wood and iron. It is said that experiments will be made to still further decrease the cost and increase its field of influence, and that its manufacture is to be pushed."

"THERE IS NO APPEAL BEYOND CÆSAR"

The Late World-Renowned Dermatologist,

Sir ERASMUS WILSON, F.R.S.,

THE FIRST AND ONLY

President of the Royal College of Surgeons

Who ever gave a public testimonial, and the following is

THE ONLY TESTIMONIAL HE EVER GAVE

"If it be well to wash the skin—and we never heard the proposition questioned—it is well also that we should be familiar with the means by which that purpose may be most efficiently attained.

"We once knew a beautiful woman, with a nice complexion, who had never washed her face with soap all her life through; her means of polishing were, a smear of grease or cold cream; then a wipe, and then a lick with rose water. Of course we did not care to look too closely after such an avowal, but we pitied her, **for soap is the food of the skin.**

Soap is to the Skin What Wine is to the Stomach,

a generous stimulant. It not only removes the dirt, but the layer which carries the dirt; and it promotes the displacement of the old cuticle to make way for the new, to increase the activity of change in the skin. Now turn we to Toilet Soaps and there we find

A Name Engraven on the Memory of the Oldest Inhabitant

PEARS.

PEARS' SOAP! an article of the nicest and most careful manufacture, and **the most refreshing and agreeable of balms to the skin."**

Readers of GARDEN AND FOREST are requested to mention that paper in corresponding with advertisers.

BURNETT'S PERFECTLY PURE Standard HIGHLY CONCENTRATED Flavoring EXTRACTS

ABSOLUTELY PURE.

FULL MEASURE.

No cartoons to hide long-necked and panelled bottles.

Thoughtful people should read the testimonials below, from cooks of national reputation.

JOSEPH BURNETT & Co., Boston:

Gentlemen,—I have used your Extracts for years, knowing them the best to be found in the market.

MARIA PARLOA,
School of Cookery, Tremont Street.

From Professor Blot.

A good dish is often spoiled or rendered unpalatable by the use of a detestably cheap, impure and deleterious Flavoring Extract.

In answer to inquiries from the ladies of my various classes, I invariably reply that during the past two years of my lectures on cookery, "I certainly prefer those prepared by Joseph Burnett & Co., of Boston, above all others."

BURNETT'S EXTRACTS are for sale by Grocers and Druggists generally throughout the United States; also in many foreign countries.

Do not accept the poor substitutes sometimes offered, but insist upon obtaining BURNETT'S, as they are THE BEST.

SIEBRECHT & WADLEY
New Catalogue of Plants.
ROSE HILL NURSERY
NEW ROCHELLE, N.Y.
Tuberous Begonias
A SPECIALTY.

PLANT TREES IN WINTER
Where the climate will permit.
We have in our storage houses a complete collection of **Fruit and Ornamental TREES, SHRUBS, GRAPE VINES, SMALL FRUITS, ROSES,** etc., and are prepared to fill and ship orders any time during the winter. Illustrated and descriptive priced Catalogue **Free.**
ELLWANGER & BARRY,
Mount Hope Nurseries, Rochester, N. Y.
Established over Fifty Years. *(Mention this paper.)*

A GREAT INVENTION,
The merits of which must Command Universal Use.
"NEPONSET" WATERPROOF FLOWER POTS
Light, Handsome,
Clean, Durable,
Cheap, Unbreakable.
Sole Manufacturers:
F. W. BIRD & SON, East Walpole, Mass.
Wholesale Agents:
R. & J. FARQUHAR & CO., S. Market Street, Boston, Mass.
AUGUST RÖLKER & SON, Station E, New York City.
WRITE FOR SAMPLES, CIRCULARS, ETC.

SPRAY YOUR FRUIT TREES AND VINES.
Wormy Fruit and Leaf Blight of Apples, Pears, Cherries, Plum Curculia prevented by spraying with the **EXCELSIOR SPRAY PUMP.** GRAPE and POTATO ROT prevented by using **EXCELSIOR KNAPSACK SPRAYER;** also injurious insects which infest Currants Gooseberries, Raspberries and Strawberries. **PERFECT FRUIT ALWAYS SELLS AT GOOD PRICES.** Catalogue showing all injurious insects to fruits mailed free. Large stock of Fruit Trees, Vines and Berry Plants at **Bottom Prices.**
Address, **WM. STAHL, Quincy, Illinois.**

V. H. HALLOCK & SON wish to call the attention of the trade and general public to their exceedingly large stocks of
BULBOUS, TUBEROUS AND HARDY HERBACEOUS PLANTS,
and beg to solicit a trial order.

GLADIOLI, extra choice named sorts, in over 1,500 varieties.
" **SNOW WHITE (NEW).** The best White Gladoli for forcing. Our mixtures of the above strains are the finest in cultivation.
IRIS KŒMPFERII, Double and Single. Over 500 named varieties. The largest and finest stock in this country.
IRIS GERMANICA. A very large collection of all the finest sorts.
IRIS SIBERICA. One of the most showy of all Irises, color Royal Purple.
LILIES. Our Lily Farm is replete with over 500 varieties of all the most choice and latest importations from Japan and other countries.
We are also very large importers of **HYACINTHS, TULIPS, CROCUS, Etc.,** commonly known as Dutch Bulbs for Fall Planting and Spring display. In our Herbaceous Grounds we have a large and varied Collection of **HARDY PLANTS,** which for a whole season flowering cannot be surpassed. The best stock of **Herbaceous Phloxes** extant.
DAHLIAS. We grow over three acres, and our stock comprises nearly 1,000 varieties, the cream of this country and also of English growers. Catalogues and Special Prices on application to
V. H. HALLOCK & SON,
BULB GROWERS AND EXPORTERS,
QUEENS, N. Y.

THE DINGEE & CONARD CO'S
ROSES GROW and BLOOM.
We have the *know-how* of growing them, keeping them, shipping them. **Acres of Glass.** If you really like Roses you are bound to come to us in the end. **Our NEW GUIDE**—124 pp., illustrated, complete, *the best book of its kind,* FREE to all interested. We send **ROSES, HARDY PLANTS, SUMMER BULBS, FLOWER** and **VEGETABLE SEEDS** postpaid, to all post offices. **Safe arrival and satisfaction guaranteed.**
THE DINGEE & CONARD CO.—Rose Growers and Seedsmen—**West Grove, Pa**

WHY ARE SOME PEOPLE ALWAYS LATE?—They never look ahead nor think. People have been known to wait till planting season, run to the grocery for their seeds, and then repent over it for 12 months, rather than stop and think what they will want for the garden. If it is Flower or Vegetable Seeds, Plants, Bulbs, or anything in this line, **MAKE NO MISTAKE** this year, but send 10 cents for VICK'S FLORAL GUIDE, deduct the 10 cents from first order, it costs nothing. This pioneer catalogue contains 3 colored plates. $500 in cash premiums to those sending club orders. $1000 cash prizes at one of the State Fairs. Grand offer, chance for all. Made in different shape from ever before; 100 pages 8½x10½ inches. **JAMES VICK, SEEDSMAN, Rochester, N.Y.**

GARDEN AND FOREST FOR 1891.

THE fourth volume of Garden and Forest began with the issue for January 7th. During the year the same high standard and variety will be maintained which have given to Garden and Forest an unrivaled position among horticultural journals. It is recognized, at home and abroad, as one of the foremost periodicals of the time. Its scope is comprehensive. It treats of the art and of the science of gardening. It considers all subjects interesting to horticulturists, landscape-gardeners, students of garden plants, lovers of nature, and owners of country homes in all parts of the American continent. It is the only journal published in the United States which discusses comprehensively questions relating to our forests as they affect the welfare of the individual and of the nation. It keeps its readers informed of all that is novel and significant in the forests and gardens of the world. It illustrates new and rare plants, and its pictures of garden and natural scenery are believed to be unequaled by those in any journal of its character. Among its regular contributors are the foremost botanists, horticulturists, landscape-gardeners, and the most successful and experienced practical gardeners in the United States. Many distinguished foreign experts contribute to its pages.

Garden and Forest is under the editorial direction of Professor C. S. Sargent of Harvard College, assisted by Professor A. S. Packard of Brown University and Professor Wm. G. Farlow of Harvard College.

As indicative of the value and usefulness of GARDEN AND FOREST, attention is invited to the following extracts from the press:

A delightful weekly companion.—*Harper's Weekly.*

Excellent above any publication of the kind in this country.—*The Nation, N. Y.*

We cannot recall a poor illustration or a poor criticism in its columns.—*Rochester Post-Express.*

Adapted to a constituency of the most cultivated taste.—*Springfield Republican.*

Is the best paper of its class in the language.—*N. Y. Sun.*

Its crisp and fresh text is almost as good as a visit to the country.—*N. Y. Tribune.*

The arbiter in matters of taste involving trees, flowers, parks and the laying out of grounds.—*Boston Transcript.*

Its writers are authorities in their lines and the illustrations are very artistic.—*Springfield Union.*

Has an assured air of mastery in its wide and fascinating field.—*Harper's Weekly.*

Stands at the head of all publications in its field.—*Toledo Blade.*

Careful and scientific, without being prosy.—*Rochester Herald.*

The leading journal of horticulture.—*Philadelphia Press.*

Is written not for the professed botanist alone, but for all those who delight in flowers.—*N. Y. Times.*

Holds one of the very first places in periodical horticultural literature.—*Revue Horticole, Paris, France.*

Permeated with a spirit of knowledge and refinement.—*Gardeners' Chronicle, London.*

Far in advance of any horticultural journal.—*Boston Advertiser.*

Its literary quality is a noteworthy feature of the journalism of the day.—*The Critic, N. Y.*

Remarkable for the rare excellence of its illustrations.—*Buffalo Courier.*

By extraordinary merit it has gained extraordinary prominence.—*Buffalo Express.*

No more important work can be named for American readers.—*Philadelphia Ledger.*

Easily the first paper that has ever undertaken to journalize the literature of the garden and the woods.—*N. Y. Mail and Express.*

No person interested in gardening or forestry can afford to do without it.—*N. Y. Lumber Trade Journal.*

A valuable publication and always interesting.—*Every Evening, Wilmington, Del.*

The ablest and most attractive paper of its kind that ever appeared in the United States.—*Troy Telegram.*

The landscape views are a surprise in their delicacy of finish.—*Buffalo Courier.*

In its field it stands without a rival in Europe or America.—*Sunday Times, Creston, Io.*

The refined and educated exponent of life suburban.—*The American Home.*

Its success is certainly indicative of a larger and more intelligent popular interest in gardening.—*N. Y. Commercial Advertiser.*

Every article exhibits careful thought and stamps the fact of the usefulness of the publication upon the mind.—*Toledo Blade.*

WHAT REPRESENTATIVE READERS SAY:

A publication of the highest value in its department, and an honor to the periodical literature of this country.—Francis Parkman.

Very attractive in appearance, of delightful variety, and of unchallenged authority.—George William Curtis.

Is taken in my family and read with much interest by us all. I consider it one of the very best publications of the kind I have ever seen.—Senator George F. Edmunds.

It appeals with equal force to practical horticulturists and botanists pure and simple.—Geo. Nicholson, *Supt. of Kew Gardens.*

A publication of great value to all interested in horticulture, arboriculture or landscape gardening.—Ellwanger & Barry.

Is doing an extremely useful work for horticulture in America.—Thomas Meehan.

Every one who takes a genuine interest in American forests, or has an intelligent appreciation of the beauty and usefulness of trees, should be a reader of the paper.—Robert Douglas.

The best horticultural journal we have had in this country, and it certainly does not suffer from comparisons made with the best foreign publications of this sort.—H. P. Walcott, *President of the Massachusetts Horticultural Society.*

Deserves the support of all lovers of the floral kingdom, and I believe that it is doing a public service in practical suggestions for the preservation of our forests, a matter of supreme importance to the American people.—Rev. Morgan Dix, D.D.

Is doing a wholesome work in teaching us to have a greater enjoyment in the artistic suggestion of Nature.—Brander Matthews.

One of the best teachers in matters of taste that we have ever had in this country. In its special branches it not only teaches the public, but teaches the teachers.—Richard W. Gilder, Editor of *The Century.*

The very best of all the periodicals of its class coming to my table. I would rather lose all the others than it.—C. L. Watrous, *Late President of the American Association of Nurserymen.*

Garden and Forest, a weekly illustrated journal of Horticulture, Landscape-Gardening and Forestry. Subscription price, $4.00 a year, payable in advance. Postage to foreign countries in the Postal Union, $1.04 additional. Single copies, 10 cents each. *A trial subscription for three months will be sent to any new subscriber for 50 cents.*

Address,

GARDEN AND FOREST PUBLISHING CO., Tribune Building, New York.

LARGE TREES. Well grown specimens of large size; Nursery Trees, recently transplanted. The best varieties of **Maples, Beech, Elms, Magnolias, Retinisporas, Piceas, Pines, Thuyas,** etc. Also **100 Varieties** of Flowering Shrubs and Vines. Come and examine the stock, or correspond with me.
SAMUEL C. MOON, Morrisville, Bucks Co., Pa.
On N. Y. Division of P. R. R., thirty miles from Phila.

PAINT YOUR ROOFS WITH DIXON'S SILICA GRAPHITE PAINT
Water will run from it pure and clean. It covers double the surface of any other paint, and will *last four or five times longer.* Equally useful for any iron work. Send for circulars. JOS. DIXON CRUCIBLE CO., Jersey City, N. J.

Mention this paper.
EVERGREEN Headquarters in the U. S. for hardy Nursery Grown *Evergreens, Fir-Larch* and *Forest Trees,* Largest stock. Best variety. All sizes for all purposes. Prices the lowest. We pack and ship with safety everywhere. Price-list free, send for it before ordering elsewhere. D. HILL, Evergreen Specialist, DUNDEE, ILL.

What Advertisers Say

"As indicative of the value of GARDEN AND FOREST as a medium of business announcement, attention is invited to the following extracts from letters of some regular advertisers:

"Orders of the best class; large buyers and good pay."

21 N. 13th St., Philadelphia, Pa.

We have used the advertising columns of GARDEN AND FOREST, and the results have been satisfactory. The orders received have been of the best class; large buyers and good pay.—JOHN GARDINER & Co.

"Best Medium for Horticulturists."

No. 22 Dey St., New York.

We find GARDEN AND FOREST a good—yes, the best—advertising medium for horticulturists, because its readers are the most intelligent.—F. E. MCALISTER.

"A Paper with Character."

Philadelphia, Pa.

Appreciating the character of your paper, we have today ordered a two-inch advertisement for thirteen times (different every week), instead of five times every other week as before.—W. ATLEE BURPEE & Co.

"A most satisfactory result."

New York.

Contrary to our usual custom; we gave GARDEN AND FOREST an advertisement some time since, and the result has been most satisfactory. Please continue our advertisement every week for next year.—VANHORNE, GRIFFEN & Co.

"Secures the best class of buyers."

60 & 70 Vesey St., New York.

By advertising in GARDEN AND FOREST we have secured a class of buyers never before reached. We shall renew our advertising in your handsome pages the coming season.—PETER DURYEE & Co.

"Its High Standard of Excellence attracts a highly intelligent class of readers."

Fulton, cor. William St., N. Y.

We feel that from the high standard of excellence maintained by GARDEN AND FOREST it must necessarily attract a highly intelligent reading class. As these are the people we wish to reach, we have used the paper from time to time for advertising purposes, and with good results.—F. W. DEVOE & Co.

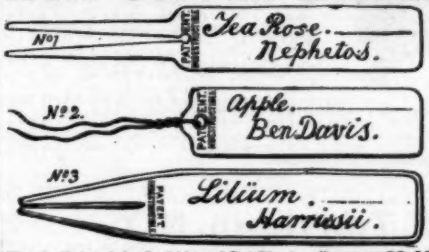
For terms, etc., address GARDEN AND FOREST PUBLISHING Co., Tribune Building, N. Y.

GARDEN AND FOREST PUBLISHING CO.,
Tribune Building, New York.

SEEDS, SEEDS, SEEDS
To our friends who have not already received it, we are ready to mail our
NEW CATALOGUE OF
HIGH CLASS SEEDS
FOR 1891,
Containing all the Novelties of the Season, both in Vegetable and Flower Seeds.
J. M. THORBURN & Co., 15 JOHN ST. NEW YORK.

SEEDS ROSES Seeds, Plants, Shrubs, Vines, Fruit & Ornamental Trees, Etc.
CATALOGUE FREE.
Over 150 pages illustrating and describing one of the largest and best assorted stocks of Seeds, Trees and Plants in the U. S. Best value for the money in our Tested Novelties and Special Low Priced Collections.
37 YEARS. 25 GREENHOUSES. 700 ACRES.
THE STORRS & HARRISON CO.,
Painesville, Ohio.

NEW COPPER LABELS For PLANTS AND TREES
Absolutely Imperishable.— Simple — Effective.



No. 1—Stamped out of 1 piece copper. The "wings" are twisted around the hard wood of the plant and does not injure the bark like wire, but is apt to break or tear off if used outside.
Per gross.....$1.35
By mail..... 1.50
No. 2—Fastens with copper wire. Where plants are large enough this label attached to a small iron staple is perfect.
Per gross.....$1.50
By mail..... 1.65
No. 3—Pointed, for Borders, Beds and Pots.
Per gross.....$1.50
By mail..... 1.75
No. 4—Pointed, for Orchids and Pot Plants.—Per gross **$2.00**, by mail **$2.25**.
No. 5—Wired Tag for Orchids and Plants.—Per gross **$2.00**, by mail **$2.25**.
Send for Samples and our Horticultural Supply Circular

These labels are made of **Prepared Copper,** extremely soft and pliable, and the name of the Plant is **indented** or **written** easily with any Pointed instrument by pressing rather heavily and holding the label upon the flat surface of an ordinary pocket book. The inscription thus made is **inefaceable** and **imperishable** and is clear and distinct as long as the plant lives. Our **GARDEN AND FARM MANUAL** is one of the most complete **SEED CATALOGUES** published.—**NEW THINGS** in **Vegetables, Flowers, Bulbs** and **TOOLS.**
JOHNSON & STOKES, Seedsmen, 217 & 219 Market St., PHILADELPHIA, PA.

FACIAL BLEMISHES.
The largest establishment in the world for the treatment of the skin and scalp, eczema, moles, warts, superfluous hair, birthmarks, moth, freckles, pimples, wrinkles, red nose, red veins, oily skin, acne, blackheads, barbers' itch, scars, pittings, powder marks, facial development, etc. Consultation Free, at office or by letter. 128-page Book on all Skin and Scalp Affections and their Treatment sent (sealed) for 10c.
JOHN H. WOODBURY,
Dermatologist, 125 W. 42d St., N. Y. City.

Woodbury's Facial Soap
For the Skin and Scalp.
Prepared by a Dermatologist with 20 years' experience. Highly indorsed by the medical profession; unequaled as a remedy for eczema, scaldhead, oily skin, pimples, flesh worms, ugly complexion, etc. Indispensable as a toilet article, and a sure preventive of all diseases of the skin and scalp.
At Druggists or by mail, Price 50c.

ESTAB'D 1872. PHILA. 30 YEARS. N. YORK 60 YEARS. INCORP'D 1890. Landscaping A Specialty.
TREES { ORNAMENTAL / Fruit & Nut Bearing } DECIDUOUS and EVERGREEN, Including the New Chestnut NUMBO.
HEDGING, FLOWERING SHRUBS and VINES.
GRAPES, SMALL FRUITS in variety, ASPARAGUS, etc.
An Illustrated Descriptive Catalogue and Planters Guide, FREE.
The WM. H. MOON COMPANY, Morrisville, Bucks County, Penna.

REID'S SMALL FRUITS, TREES, VINES, SEEDS, ORNAMENTALS,
CRATES and BASKETS. Everything for the fruit grower. **Prices Low. Estimates Free.** You save one half by seeing our list. *NEW FRUITS a specialty.*
Illustrated Catalogue *FREE.* **E. W. REID, Bridgeport, Ohio.**

FAY CURRANT HEADQUARTERS. GRAPES.
BEST & CHEAPEST
NEW GRAPES Esther, Rockwood, Eaton, Moyer and all others New and Old. SMALL FRUITS. Catalogue Free. GEO. S. JOSSELYN, FREDONIA, N. Y.

HARDY "PERPETUAL" ROSES

We offer extra-sized, large, blooming, 3-year-old plants,

THAT WILL BLOOM THE SAME SEASON PLANTED, in order a demand for plants ready for immediate flowering; not little plants that require time to grow, but good strong plants that will bloom this summer, and **AT VERY LOW PRICES.** Plants that will delight every one in every way; so cheap as to be within the reach of all, and so choice as to meet the strictest scrutiny of the most critical rosarian. Our collection contains only the finest and newest sorts in cultivation, among which are the following gems: **ALFRED COLOMB,** a grand rose, very large and extremely fragrant, carmine-crimson. **ULRICH BRUNER,** an elegant flower, finer in every way than "Genl. Jacqueminot," bright cherry, exquisite. **GLORIE DE PARIS,** the most lovely shade of carmine, very large and fragrant. **JEAN LIABAUD,** fiery crimson, shaded with black, rich and velvety. This variety approaches **a black rose** most nearly of any **MAGNA CHARTA,** immense flowers, the largest rose grown, rich dark pink, superb. **MARIE BAUMANN,** crimson vermilion, exquisitely shaded and richly perfumed; no collection is complete without it.

Single plants of the above-named sorts will be furnished for

50 cents each, or the 6 for $2.50,

OR

12 plants, in 12 best sorts (including the above), for $4.00
25 " " 12 " " " " " " 7.00
100 " " 25 " " " " " " 25.00

We offer also some Exquisite Novelties and Oddities in New Japanese Forms

of this charming flower. They form a most unique group, and will be found invaluable on account of the rich decorative effects produced. The foliage is particularly attractive, very dark glossy green, shining as if varnished, studded with large single beautiful flowers, 4 inches across, in the wildest profusion; they flower from early summer until autumn, and are succeeded by large bright colored crimson seed pods, so showy that it is difficult to say whether the plants are more effective in flower or fruit. **RUGOSA RUBRA,** deep rose, borne in large clusters. **RUGOSA ALBA,** the famous white variety. **Md. GEORGES BRUANT,** very rare; long slender white pointed buds, very fragrant. **Price $1.00 each, the 3 sorts for $2.50; $9.00 per dozen. PERSIAN YELLOW,** the finest bright yellow, hardy rose, foliage faintly scented like the sweet brier. **Price 75 cents each, 3 for $2.00; $6.00 per dozen. Md. PLANTIER,** "the snow white rose," the finest white for bedding in masses or for cemetery planting. A perfect snow-ball when in bloom. **Price 50 cents each, 6 for $2.50; $4.00 per dozen.** By freight or express at above prices. **BY MAIL ON ACCOUNT OF THEIR LARGE SIZE, 3 CENTS EACH MUST BE ADDED FOR POSTAGE AND PACKING; SAFE ARRIVAL GUARANTEED** to any P. O. in U. S. or Canada. Go best and cheapest by mail except in large quantities and in near vicinity.

ORDER AT ONCE Can be planted as soon as frost is out of ground; full instructions for cultivation sent with each order, also a copy of our large **Illustrated Catalogue** of

ALL THE BEST NEW SEEDS AND PLANTS It is very complete, handsomely illustrated, artistic, of particular interest to all lovers of choice flowers. Sent free to all readers of GARDEN AND FOREST inclosing stamps to pay postage. Address, mentioning GARDEN AND FOREST,

F. R. PIERSON, FLORIST AND SEEDSMAN. **Tarrytown, N.Y.** P. O. Box N.

TRY **DREER'S GARDEN SEEDS,**

PLANTS, BULBS, and Requisites.

They are **THE BEST** at **THE LOWEST PRICES.**

DREER'S GARDEN CALENDAR for 1891 full of garden topics, mailed for 6c. postage. Abridged edition Free.

HENRY A DREER, 714 Chestnut Street, PHILADELPHIA, PA.

USE FERRY'S SEEDS

BECAUSE THEY ARE

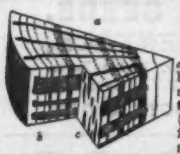
THE BEST.

D. M. Ferry & Co's
Illustrated, Descriptive and Priced

SEED ANNUAL

For 1891 will be mailed FREE to all applicants, and to last season's customers. It is better than ever. Every person using *Garden, Flower or Field Seeds,* should send for it. Address

D. M. FERRY & CO.
DETROIT, MICH.
Largest Seedsmen in the world



AMERICAN WOODS.

A book on woods, containing *actual and authentic specimens* beautifully prepared so as to show transverse, radial and tangential views of the grain (See fig. *a*, *b* and *c*), and with full text. Very valuable for school or home.

PREPARATIONS OF WOODS FOR STEREOPTICON AND MICROSCOPE, and **WOODEN CROSS-SECTION CARDS,** very nice for fancy and business purposes. Send for circulars.

R. B. HOUGH,
Lowville, N. Y.

SEEDS.

My Annual PRICED CATALOGUE is now ready and mailed free to all applicants. It contains all the leading and most popular sorts of

VEGETABLE, FARM,

AND

FLOWER SEEDS,

Besides all the desirable novelties of last season, and nearly everything else in my line of business.

ALFRED BRIDGEMAN,
37 East 19th Street, New York City.

Readers of GARDEN AND FOREST are requested to mention that paper in corresponding with advertisers.

STEVENS & MORRIS PHOTO-ENGRAVERS & DESIGNERS 74 & 76 Hund ST NEW YORK

CORRESPONDENCE SOLICITED.

A SUPERIOR RAPID PROCESS OF PHOTO-ENGRAVING FOR ALL ARTISTIC AND MERCANTILE PURPOSES.

Arnold, Constable & Co.

LYONS SILKS.

Broche Silks and Satins.
FACONNE CHEVRON.
Diagonale and Ondule.
PLAIN & CORDED GROS DE TUNIS,
WHITE VELOUTINE, FAILLE & SATIN
For Wedding Dress.
BROCHE & RAYE VELOUTINE,
Embroidered and Brocaded
GAZE, GRENADINE,
CREPE DE CHINE
For Ball and Evening Dress.
EMBROIDERED GAZE ROBES.

Broadway & 19th st.
New York.

THREE GRAND BERRIES.

All are fully illustrated and described in **Lovett's Guide to Horticulture.** Also all good old and choice new varieties of Small and Orchard Fruit, Nut and Ornamental Trees and Plants, etc. It is a book of over 80 pages, finely printed and copiously illustrated. It states the defects and merits, gives prices and tells how to purchase, plant, prune and cultivate. Mailed free; with colored plates 10c.

Trees and Plants by Mail a Specialty.

J. T. Lovett Co., Little Silver, N. J.

TREES FARE, CHOICE AND HARDY; also the Best SHRUBS, VINES and FRUITS in quantity.

The finest Japan Maples, hardy Azaleas, Rhododendrons, Roses, Evergreens, and Trees for Avenue or Street Planting Choice Collection of Native Herbaceous Plants. Extra Foreign Vines for Graperies. Catalogues and full particulars on application.

FRED. W. KELSEY, 145 Broadway, New York.

The finest Order of Engraving

PHOTO-ELECTROTYPE ENGRAVING COMPANY
7·9·& 11 NEW CHAMBERS ST
NEW YORK.
formerly 20 Cliff St.